

## Industry

- [Healthcare](#)

## Customer application

- VR-based concussion assessment

## Solution

- [IoT Data Management](#)

## Use case

- User profile store
- Offline access

## Product

- [Couchbase Server](#)
- [Couchbase Mobile](#)

## Cloud Provider

- AWS

## Key features

- [N1QL](#)
- [Analytics](#)



## SYNCTHINK

SyncThink develops innovative technologies that improve concussion assessment and monitoring on the sports field or anywhere else. Using a virtual reality headset and a tablet, their EYE-SYNC platform can identify eye tracking impairment at the scene of an injury. The company requires a data platform that works even if there's spotty connectivity, plus enterprise security to meet rigorous patient privacy regulations such as HIPAA. After evaluating a range of other data platforms, SyncThink selected Couchbase for its mature, robust, and mobile-ready platform. For SyncThink, Couchbase and AWS are better together by providing best practices for flexible application development, data security, scaling, and resource usage.

### CHALLENGES

- Needed a robust, mature platform ready to support cloud and mobile integration
- Offline and seamless sync for environments with limited connectivity
- Security ready to meet HIPAA standards

### OUTCOMES

- Couchbase on AWS provides easily scalable performance for mobile applications
- Fast, automatic sync speeds up concussion assessments after injury
- Built-in enterprise security supports HIPAA compliance
- Easy admin keeps dev team focused on product

“The Couchbase sync capabilities are very impressive. Teams can test multiple players simultaneously, then sync a large amount of data seamlessly.”

— Daniel Beeler  
Chief Technology Officer, SyncThink



SYNCTHINK

### Couchbase + AWS Better Together for

- Versatility
- Performance
- Scalability
- Value

## BUILDING NEW INSIGHT INTO BRAIN INJURY

### Improving assessment and recovery for top-tier athletes

Awareness is growing about the serious long-term effects of concussions. From college football teams to branches of the military, more and more organizations are now looking for ways to improve concussion assessment and monitoring so they can minimize the damage caused by these traumatic brain injuries. SyncThink is developing innovative technology that can help address these needs. Through collaboration with the Brain Trauma Foundation and the U.S. Department of Defense, SyncThink developed EYE-SYNC – an eye-tracking platform that uses a virtual reality (VR) headset plus a tablet to rapidly identify eye tracking impairment at the point of injury.

### THE CHALLENGE: BUILD AN INNOVATIVE MEDICAL DEVICE ON A ROBUST, MATURE DATA PLATFORM

SyncThink is dedicated to reducing the subjectivity in concussion assessment. Its innovative device uses eye tracking to generate objective measurements for evaluating whether someone has sustained impairment after potential injury. “Our assessment paradigm is fairly simple,” says Daniel Beeler, chief technology officer at SyncThink. “The subject wears a VR headset and watches a target moving in a circle. Infrared cameras within the headset track eye movements. Deviations from the predicted eye movement provide an objective measurement for gauging impairment.”

Though the paradigm might be simple, the solution integrates a variety of cutting-edge technologies, from the VR headset and an Android tablet to the application, backend data platform, and AWS cloud services that the company uses. “Getting all of those technologies to cooperate and work together can be challenging,” says Beeler. “Using robust, mature technologies helps reduce potential issues.”

When searching for a data platform to support its solution, the company also had additional priorities. For example, the data platform had to provide an offline mode to accommodate environments where connectivity might be spotty, such as in football stadiums. “In large stadiums, tens of thousands of fans might be using smartphones, and that can reduce available bandwidth,” says Beeler. “We need a data platform with offline functionality so team doctors can conduct assessments on the sidelines and then seamlessly sync with the AWS cloud environment when sufficient bandwidth becomes available.”



The data platform also had to provide the security to meet rigorous patient privacy regulations. “EYE-SYNC is an FDA-cleared device,” says Beeler. “We need a data platform with security capabilities that enables us to meet HIPAA privacy regulations.”

After evaluating a range of other data platforms, the SyncThink team selected Couchbase for its EYE-SYNC solution. “We wanted a NoSQL data platform, and there was only one that met all of our requirements,” says Beeler. “Couchbase is a mature, robust, and mobile-ready platform that can provide the security we need for HIPAA compliance.”



After a successful in-house proof of concept, the SyncThink team engaged Couchbase and a Couchbase partner to deploy the platform in production. The company implemented a HIPAA-compliant instance of Couchbase Server on the AWS cloud service, and put protocols into place to help ensure data protection. Couchbase Mobile runs on the Android tablets that accompany the VR headsets. The tablets run in offline mode when necessary and then sync with Couchbase Server when connectivity is available. “It just works – and that’s what we were looking for,” says Beeler.

Since deploying Couchbase, the company’s appreciation for the platform has grown. “We continue to explore more of the robust set of features Couchbase offers, and we’ve been very pleased,” says Beeler. “For example, we’ve found that maintenance and accessibility capabilities are definitely in line with our needs and expectations.”

## THE RESULT: DELIVERING A SEAMLESS MOBILE EXPERIENCE AND PREPARING FOR GROWTH

### Enabling fast, mobile assessments with offline functionality.

By using Couchbase Mobile, SyncThink enables team doctors to have a responsive experience while conducting sideline assessments even if network connectivity is intermittent. Doctors can run tests, capture results, and then sync data with Couchbase Server as soon as connectivity improves.

The solution can sync even large data collections rapidly. “EYE-SYNC collects a decent amount of data in a 60-second evaluation period, and we need to sync all of that data as soon as possible,” says Beeler. “The Couchbase sync capabilities are very impressive. Teams can test multiple players simultaneously, then sync a large amount of data seamlessly. They can get results fast, which means they can quickly determine whether a player can stay in the game or requires additional medical attention.”

## Streamlining administration

SyncThink has developed its groundbreaking EYE-SYNC solution with a relatively small team. To keep moving forward, the company wants to avoid excessive administrative tasks that can pull team members away from innovation. “We need to minimize IT management overhead as much as possible,” says Beeler. “The Couchbase administrative tools help streamline administration so we can concentrate our resources on developing new features for our customers.”

## Tracking brain health for Stanford football

The Stanford University football team was an early adopter of EYE-SYNC, which the team uses across the entire lifecycle of brain health for players. “As new players join the team, they are screened using EYE-SYNC,” says Beeler. “If a player is injured during a game, team doctors on the sideline use EYE-SYNC for a fast, objective assessment that helps them make the return-to-play decisions. For players who suffer injuries, clinicians can subsequently use EYE-SYNC to monitor their recovery progress over time. At each step in this lifecycle, the solution reduces reliance on subjective self-reporting by providing objective measures.”

By selecting Couchbase and deploying it on the AWS cloud, SyncThink has the agility and scalability to support a rapidly growing company. “We’re definitely focused on business growth,” says Beeler. “Our goal is to provide our technology for more teams and users in a broad array of fields, including the military. Couchbase on AWS gives us the scalable platform we need to pursue our business goals.”



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](http://www.couchbase.com).