Faith Comes by Hearing (FCBH) Records Bible Translations Worldwide Using Couchbase Mobile

Faith Comes By Hearing (FCBH) is a Bible ministry that works around the globe to record and provide free Audio Scripture in every language that needs it. Much of FCBH's work is conducted in remote locations, which creates many unique challenges. As the organization's mission grew, FCBH struggled with issues of scalability, data management, and offline sync. By migrating the database to Couchbase Capella™ DBaaS, FCBH gained the ability to sync and collaborate on data even without the internet and to scale quickly and cost-effectively at any time.

Challenges

- Scaling the database was complicated and expensive, so FCBH was often under-resourced
- It was difficult to store, manage, and collaborate on recorded data due to remote work locations
- FCBH is heavily dependent on offline sync, but couldn't maintain it reliably at scale

Outcomes

- Capella allows FCBH to scale incrementally at any time without relicensing or unplanned costs
- Automated sync makes it easy to keep the database accurate and up to date across locations
- Reliable peer-to-peer sync allows teams to collaborate smoothly in remote locations without internet
- 250+ ongoing projects, increasing at a rate of 15-20 per month – the database can easily scale to handle 1,000+ projects

Industry
- High Tech

Customer application
- Audio recording application

Use case
- Field Service

Product
- Couchbase Capella
- Couchbase Mobile
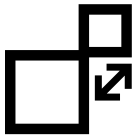
Key features
- Mobile
- XDCR

Cloud provider
- AWS

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— **Brad Brane**, Manager of Software Development and Support, Faith Comes By Hearing

Approximately 85% of the world's population speaks one of the top 100 languages, and FCBH focuses on serving the remaining 15% of people (around 1.3 billion) who speak 7,039 lesser-known languages. Over 70% of people are either non-literate or considered oral learners and would have limited or no access to a Bible unless it was recorded in an audio format.

FCBH produces audio recordings of Scripture in national languages and makes those recordings available, easily accessible, and free. When creating a Bible recording, first the translated text must be acquired. Then a recording team is sent to an area where the language is spoken. This team works 10-12 hours per day over the course of a few months, overcoming illness, bad weather, and unwanted ambient noise. In instances where meeting to record is too dangerous or difficult, there's a tool called Virtual Recording which allows native speakers to record safely from their home, church, or office.

For languages where there's no written Bible yet, the translations happen orally, combining both the translation and recording processes. After the Audio Bible recording is finished, FCBH initiates listening programs around the world using tools such as Audio Bible apps, SD cards, online downloads, playback devices, and word-for-word Video Bibles called Scripture Films.

THE CHALLENGES:

FCBH encounters a variety of challenges as they seek to produce and collaborate on hundreds of audio recording projects – spanning tens of thousands of files – in remote villages.

"One of the main challenges we were looking to solve is how to handle a technical process that generates a lot of data in a remote location, not lose track of any of this data, and be able to work collaboratively on it," said Brad Brane, Manager of Software Development and Support at FCBH.

FCBH takes edge and offline capabilities to a whole new level in work locations where internet is rare or nonexistent – some of the most remote villages are hours away from the nearest internet cafe. Finding reliable electricity can also be a challenge, and the villages often rely on portable generators. This means data can't be synced back to the cloud without going back into the nearest town, which puts the data at risk of being lost.

"We have projects where our team will work in the morning, then at lunchtime turn on the village's power generator, plug their laptops into the generator to recharge them, and then continue with work in the afternoons. That's life for some of our groups. So yes, we definitely take 'edge' to a whole new meaning from the way it's typically used in the technology world," said Brane.

FCBH initially wrote its own offline sync, but maintaining it reliably at scale was not feasible. It was originally expected to serve about 100 projects, but the organization determined it needed more scale. Couchbase was selected since it was the only database that featured serverless offline data sync.

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THE SOLUTIONS:

FCBH has two ecosystems (consisting of multiple tools) that are using Couchbase:

Vessel – This ecosystem is used if there's an existing written translation of the Bible in that community's language. Such communities often comprise oral learners, so FCBH records their written Scripture in audio. People from the village read the Scripture, and it's recorded in line by line sections. Those recordings are synchronized back to the cloud so other teams can put it together in the correct order and master it. Typically, this is a much more straightforward and quicker process. Field teams consist of 2-3 trained audio specialists. It takes about 6 weeks to do a New Testament equivalent recording, and 10K audio files are generated in each of these projects.

Render – This ecosystem is a new translation tool designed to facilitate a full translation process off-grid. It's used in oral cultures whose languages have no written form. In this case, translators listen to Scripture in a language they understand, internalize it, and use Render to record a translation in their mother tongue. In these scenarios FCBH isn't sending people to record the Scripture, but instead are teaching the people in the village to operate the tool. Being able to read isn't necessary to operate the tool as it is color and icon driven. This ecosystem is a lot more collaborative, involving a back and forth process with the recording. Data is transmitted from the village to a linguistic expert's computer so they can listen to it, check it, provide feedback, and then send it back. This collaborative process happens multiple times between multiple groups to ensure accuracy between the original reference language and the native language. All of this is done with Couchbase's offline sync and is sent to the cloud. In total, the process takes about 5-7 years and requires FCBH to manage between 30K and 50K+ audio files.

All of these processes require numerous steps that need to be completed offline by different team members using many computers with no internet connection. As one team finishes a job, they need to get it to the next team. Couchbase Mobile enables the data to get there seamlessly, fast, and without any data loss.

"If we have five computers in a village, all of those computers have a copy of the data. Redundancy is critical. If we were to lose that data it's not easily replaced, so we're always prepared with backups. In remote environments, the collaboration aspect and Couchbase's offline sync is huge, enabling so many different people to work on the same project and always have the most updated version," said Brane.

To help the peer sync process be as smooth as possible, FCBH uses in-line attachments instead of loose audio files for Vessel. Render uses audio blob attachments. These methods minimize the size by breaking the files up into smaller chunks. The organization also manages off-grid data in a similar way, splitting documents that see heavy usage. This enables both the corporate and field teams to make changes without conflicts.

"Database sizes matter, so we divide them into smaller pieces with one specific database for audio files. We use 'purge' in Couchbase Mobile to clear everything off the local machine, while leaving it intact on the cloud environment for future use. We run this in between projects to keep the database sizes reasonable and tidy. We've learned to index carefully – a few high-value indexes make a huge difference for query performance," said Brane.

THE RESULTS:

When the organization only had the Vessel ecosystem, it was self-managed for the first few years with Couchbase. Then as the needs continued to scale and FCBH got ready to roll out Render, the organization migrated to Couchbase Capella on Amazon Web Services (AWS) for additional flexibility and scalability. There were already major pieces of infrastructure in AWS, so it made sense to unify and streamline the architecture. It also means the organization can hire people who specialize in AWS and are more capable of supporting multiple tools.

As usage of FCBH's tools continues to grow, Capella's flexibility and scalability are key for the organization.

"The usage of our tools is growing considerably. One of the exciting aspects about Capella is that if we need to increase the cloud storage in a couple of months, we don't need to relicense anything or change contracts – we can just scale up and grow seamlessly. When our environment was self-managed, we were more reluctant to make a change until it became absolutely necessary. With Capella, we can make more incremental changes to serve our partners better," said Brane.

By migrating to Capella, FCBH is able to manage more without having to grow the team. While the workload of the team didn't change, they could now double what they could previously handle. In seven years, FCBH has grown from 3-4 projects at a time to now 250+ ongoing projects, increasing at a rate of 15-20 per month. The database can easily scale to handle 1,000+ projects.

The driving organizational goal is called Vision 2033. By 2033, FCBH feels it's possible to have Scripture recorded in every language that needs it. One of the only ways to accomplish this feat is to equip people around the world to own the process of recording Scripture in a self-service way. In partnership with more than 700 organizations, Faith Comes By Hearing has already recorded Scripture in 2,100+ languages and adapted 1,500+ Scripture Films for over 80% of the world's population, so it's clear that goal is becoming more attainable with each completed project.

Modern customer experiences need a flexible database platform that can power applications spanning from cloud to edge and everything in between. Couchbase's mission is to simplify how developers and architects develop, deploy and run modern applications wherever they are. We have reimagined the database with our fast, flexible and affordable cloud database platform Capella, allowing organizations to quickly build applications that deliver premium experiences to their customers – all with best-in-class price performance. More than 30% of the Fortune 100 trust Couchbase to power their modern applications. For more information, visit www.couchbase.com and follow us on X (formerly Twitter) @couchbase.