Google Cloud

Onix

# Solving the interoperability problem with the Google Cloud Healthcare API

In healthcare, crucial data often resides in disconnected, siloed systems that don't communicate well with one another. The transformational Google Cloud Healthcare API helps to unlock the potential of healthcare data by empowering secure, scalable information exchange between health IT systems and cloud-powered applications.

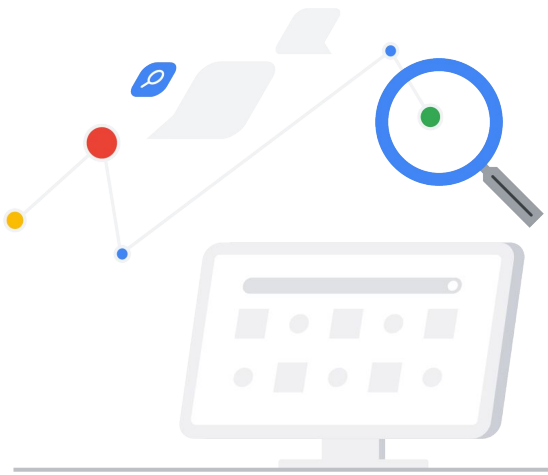
## About Onix

Onix enables health and life science organizations to securely leverage the cloud to improve clinical outcomes, accelerate research discoveries, and drive innovation in a HIPAA-compliant environment.

It's a problem that started when people first learned to count using their fingers and toes—what do you do when you run out? In the centuries since, innovators seeking better counting tools brought us the abacus, slide rule, spindle, and calculator. When Charles Babbage created his analytical engine, the first programmable computer, he arguably launched the Information Age.

Just as counting was limited only by the power and capacity of the tools used, so is today's quest to collect and analyze data. In creating systems that gather healthcare data, software developers often worry about scalability, or the ability to run massive calculations on many terabytes of data. They must also overcome data silos. When data is stored in multiple locations in differing formats, it's accessible only by copying and moving huge stores into a central location. Then there's the potential for exposing Protected Health Information. Overall, the challenge of collecting and analyzing data is complex and expensive.

Onix is helping developers to solve these problems with the Google Cloud Healthcare API by creating a repeatable, scalable process for accelerating deployment of the API, as well as an appliance that will automate the process of generating MITRE's Synthea™ synthetic patient data sets in Google Cloud Platform (GCP).



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## Confidence in the cloud

"Google Cloud Healthcare API leverages the most widely used formats for healthcare data, Fast Health Interoperability Resources (FHIR), HL7v.2 and DICOM," says Sunnie Southern, Vice President for Onix Health and Life Sciences Division. "It provides very specific services that are critical for healthcare organizations, and really supports interoperability, including de-identification and granular security controls." Because data is stored in Google Cloud Platform (GCP), she explains, "you can apply the amazing technology around analytics and machine learning to not only allow data flow in a secure way, but to also leverage insights from that data," says Southern.

Although more organizations are storing highly sensitive information in the cloud, even those databases can end up siloed. Standards like HL7 and the newer FHIR protocols help eliminate medical information silos, explains Yasir Drabu, Principal Engineer for Onix Health & Life Sciences Division. However, when it comes to interoperability, "the challenge really comes down to: how do we set this up, how do we scale it, how do we secure it, make sure we are compliant along the way? The Google Cloud Healthcare API makes it possible for organizations to securely and compliantly share data using the most widely used clinical healthcare data formats - like FHIR."

Sunnie Southern, MS, RD, LD and Vice President, Onix Health and Life Sciences Division

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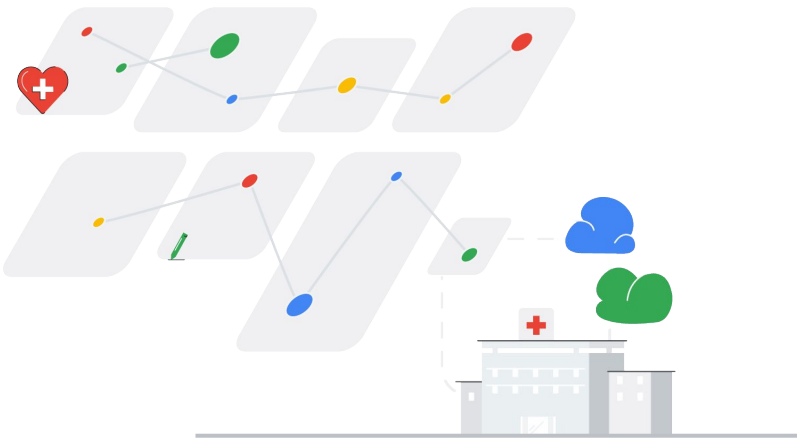

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## Creating a realistic test environment

“How does someone doing application development do it without risking some misconfiguration?" asks Drabu. "How do we test it? How do we scale it? How does it meet our needs?" To answer these questions, Onix and the Google Healthcare API team collaborated to set up SYNTHEA on GCP. MITRE developed SYNTHEA to create synthetic but real-looking patient data from census information. “It provides very realistic looking data, all of which you can actually test,” says Drabu. Onix created different workloads from SYNTHEA, “using compute instances to generate the synthetic data, and store that data, which is in the FHIR STU3 format, in cloud storage,” he explains.

Onix loaded synthetic data into the FHIR store, which the Healthcare API supports. “The FHIR store takes patient data and stores it in a way that’s easy to retrieve and follows the same set of APIs and protocols, making it easy for other systems that can consume and interact using those protocols to pull and push data into the system,” explains Drabu. “Imagine there's a proprietary EMR. Developers can simply write a translation into the FHIR store and make that data accessible with the right permissions and credentialing to other organizations. That's where the Healthcare API makes it super easy to connect patient data between disparate systems.”

GCP’s certifications for HITRUST and HIPAA, plus ready-to-use scalability and security, saves developers from having to build a healthcare data test platform from scratch.

Yasir Drabu, PhD and Principal Engineer, Onix Health & Life Sciences Division

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## Running the test

Once Onix loaded the SYNTHEA data into the FHIR store, they ran different workloads to test how well it would scale. “We went all the way from a small subset of 10,000 patient records up to 10 million,” says Drabu. As they increased the size of the dataset, the team measured response times for searching, querying, inserting, and deleting data. “We created a standard set of test scripts, applicable to the different APIs, and at each load—let's say at 10,000 records or a million records—we ran a test script,” Drabu explains. “Then we collected data from those test scripts and stored it in BigQuery for analyzing the performance.” The team visualized the results in Data Studio.

Onix accomplished the goal of creating a repeatable, scalable process to accelerate software development. “Based on this work, we are creating an appliance, which we'll publish through the marketplace, where people can simply use the SYNTHEA engine, point to their FHIR store, and load the data directly,” Drabu summarizes. The appliance takes care of data orchestration, making it even faster for researchers or developers to use the Google Healthcare API.

## Future analyses made easier

“Using the SYNTHEA data so that researchers, data scientists, and developers can get started with the Google Healthcare API and Google Cloud Platform, and basically build their applications almost to the point of full execution,” says Southern, “they can test before they have to accept live data.”

The process Onix developed allows researchers, data scientists and developers to start using Google Healthcare API quickly, “to realize what we've been trying to do in healthcare for so many years, which is to securely share that information with the right person at the right time so that physicians can make the most informed decisions about how to care for patients,” concludes Southern, “and patients can make the most informed decisions about their own care.”

The appliance, coupled with Synthea and the Google Cloud Healthcare API on GCP, becomes a very useful tool for healthcare teams. They are enabled  to build and test applications; to expand the limits of data analysis and push beyond the constraints of today’s siloed data stores. Babbage would be proud.

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Google Cloud Healthcare and Life Sciences visit:

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