Case study

How Augury reduced machine failure by 75% with Google Cloud

Client
Augury

Location
Israel

Technologies
Compute

Data Analytics

Kubernetes

Machine Learning

Industry
Technology

Trying to solve software problems by manually cleaning fan airways is one way to troubleshoot a manufacturing machine, but the founders of Augury felt they could offer a better solution.

Though they could usually tell when something was off by changes in sound or performance, the machines themselves lacked the ability to signal exactly what was going on. As graduates of the Technion—Israel Institute of Technology, one of the world's top technology universities — Gal Shaul and Saar Yoskovitz studied computer science, electrical engineering, and physics, and worked together on projects that looked at sound in relation to machine learning. Gal had a particular background in signal processing. The pair had an epiphany when they realized that if people could hear that something was going on, machines could be taught to hear it too. They decided to launch a startup dedicated to making machines smarter and more reliable, using machine learning and IoT technology.

Augury was launched in 2011 as a cloud-based solution deploying IoT devices that are connected to manufacturing machines around the world. These devices continuously send data to the cloud where it is analyzed by Augury's machine learning algorithms, resulting in insights that are immediately provided to its customers.

The brief

Augury has grown steadily since its startup days, now employing more than 100 people in New York and Israel who work to provide customers superior insights into the health and performance of their machines. Specifically, the company helps high-speed manufacturing and continuous production for Fortune 500 companies in industries such as pharmaceuticals, food and beverage, and consumer packaged goods, among others. In these "always-on" manufacturing environments, maintaining production health is key. Augury's technology helps customers perform vital monitoring of their manufacturing and production lines using IoT devices and manufacturing analytics. The platform includes sensors, networking connectivity, dashboards, and diagnostics. Augury's technology uses machine learning algorithms to monitor and analyze vibration, temperature, and magnetic field data in real time. With actionable machine health insights at their fingertips, engineers and maintenance professionals can protect manufacturing assets and ensure that production lines are always on.

Recently, Augury had to rebuild its IoT platform to be able to scale sufficiently and handle a significant increase in enterprise customers. As part of this rebuild, it needed a stable cloud solution for IoT that could offer superior scalability, as well as a broad range of technologies and functionality. After successfully migrating a part of their research environment to Google Cloud two years ago, Augury decided to complete a full migration that also included moving all of the company's microservices to Google Kubernetes Engine (GKE). Augury chose DoiT International as its implementation partner for the company's unrivaled Google Cloud and Kubernetes expertise.

"With the help of Google Cloud Partner DoiT International, our transition to Google Cloud was smooth and efficient," says Gal Shaul, co-founder and Chief Technology Officer at Augury. "DoiT engineers were there to answer all of our questions, consulted with us on best practices for Google Cloud deployment, and helped us solve any issues that arose, quickly and efficiently."

What we did

Augury uses Google Cloud big data technology including Cloud Dataflow and BigQuery to push data from basic Cloud Storage buckets into BigQuery tables, which enables tens of millions of machine learning features. Being able to quickly and easily load data without complicated ETL processes allows researchers to get quick insights while running fast queries. It also enables Augury to run faster research cycles and enhance the algorithms that predict machine failures.

Improving the flow of ideas between research, development, and production

Both DoiT and Augury appreciate that Google Cloud offers a broad range of IoT and research-oriented products, releasing new products frequently that not only enable research and development, but remove the need for the company to build tools in house. Developing basic functionality such as registration, authentication, and data transfer wasn't where Augury wanted to spend its resources.

Google Cloud products such as Cloud IoT Core, Google Kubernetes Engine, Google Cloud Dataflow, Cloud Dataproc, and Cloud Datastore enable Augury to use the same data for their research and production environments, which Gal finds extremely helpful. He explains that being able to see the growth and rapid iterations that come from working with open source pipeline technologies such as Google Cloud Dataflow and Apache Beam allows the Augury team to work on algorithms with a proof of concept, agile mindset, while also contributing back to the open source community. Working in pipelines allows Augury to move back and forth from research to production quickly, enabling the company to deliver value as fast as possible to its customers. This is a new concept for factories, which are experiencing true digital transformation with Augury solutions.

> "We start with an experiment," says Gal, "if it works well, we can expand it rapidly, and if it doesn't, we can try something else quickly. Google Cloud gives us the tools to understand what's right for us, for our customers, and for our ever-changing industry."

Being able to run in multiple environments was also a selling point of GKE. Though Augury runs on Google Cloud, some of its customers use other cloud solutions. With customers sometimes having different needs, the ability to migrate microservices from one place to another while remaining always available was extremely important to the company.

Delivering business impact through machine health insights

Augury is able to keep its promise of delivering continuous insights to customers by relying on the direct capabilities of Google Cloud IoT technologies. Google Cloud IoT Core, Cloud Pub/Sub, and Google Cloud Dataflow make it easy for Augury to consume telemetry from IoT devices deployed on factory floors. This constant flow of incoming data allows for ongoing improvement of capabilities to monitor and fix problems with IoT devices, thanks to early detection of connectivity issues. This makes sure that sensor data arrives in an uninterrupted manner without data loss and that customers receive early warning of developing machine failures.

Following rapid growth with its customers, Augury faced initial challenges in managing the sheer volume of data coming in through its IoT devices. The autoscaling features included in GKE solved this by ensuring the solid and balanced algorithm processing latency that meets the Service Level Agreement (SLA) that Augury has with its customers. Even if a large facility comes back online after having been offline for a long period, pushing huge volumes of data in the process, GKE can handle the flow. With GKE autoscaling, the company can control the number of algorithm instances running in response to data flows and keep task queues low.

Augury has been able to grow its field deployments and improve its diagnostics capabilities without affecting service performance since adopting GKE. Thanks to the management layer for monitoring services such as memory consumption, GKE allows Augury to identify and fix issues early in order to avoid problems that can cause performance issues to other parts of its system.

This emphasis on continuous data flows and analysis means that Augury customers get the benefit of real-time insights into machine health. Some manufacturing customers look at this data as often as hourly, and rely on Augury to consume, analyze, and deliver insights as quickly as possible. GKE plays an important role by ensuring that Augury instances will always run in a balanced manner, allowing the company to provide seamless service and insights to customers.

The result

Augury works in customer environments with a lot of moving pieces where things can change very quickly. So it needs to be conscious of not letting customers become overwhelmed by the fast feedback loops coming from IoT-enabled machines, while empowering smarter decision-making through the power of AI. The effects of digital transformation on the manufacturing industry are changing the way that companies make decisions, treat maintenance, and understand overall production health. Gaining visibility into machine health enables companies to transform their supply chain and culture to agile just-in-time manufacturing, which can in turn save millions of dollars in inefficiencies improvements.

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Save

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“Understanding machine health is the foundation of digital transformation for manufacturing,” adds Gal. “It’s not a maintenance problem, it’s an overall production event that needs everyone on board. IoT technology and Google Cloud let us work across organizations so we can create that change together.”

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Gal Shaul, Co-founder and CTO

Let’s Talk

Book a call with one of our cloud experts to kick start your digital transformation.

Book a call →

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