Airbus: Charting new territory with Google Cloud Platform

The Intelligence business line of Airbus Defence and Space uses Google Cloud Platform to build a scalable, online platform, enabling customers to access petabytes of satellite imagery in real time.

GOOGLE CLOUD RESULTS

- Reduces the time required for customers to access satellite imagery from hours to less than half a second
- Delivers a scalable, cloud-based platform for satellite images with no limits on size or users
- Provides access to satellite imagery for smaller organizations with streaming technology, APIs, and innovative pricing schemes

Airbus Intelligence, a unit of the Airbus Defence and Space division, delivers in comprehensive, up-to-date satellite imagery and data to more than 1,200 customers in over 100 countries around the world. Since its founding more than three decades ago, Airbus Intelligence f has expanded its roster of clients from governmental security to include other

entities that benefit from high quality imagery such as agricultural companies and oil and gas firms. To stay ahead of the curve, Airbus Intelligence was keen to build on its success and redesign its satellite imagery platform for scale and speed. To do that, it turned to Google Cloud Platform (GCP).



If we wanted to move forward, we needed to have our satellite images online and provide our customers with real-time access. Google Cloud Platform helps us to do that while maintaining our capacity to offer very large amounts of imagery and data.

Laurent Gabet, Optical R&D Manager, Airbus Adds millions of square kilometers of imagery per day

AIRBUS

Google Cloud Platform for security and scalability

Producing satellite imagery is a complex business. Airbus currently operates and has access to 14 different satellites with the ability to take images all over the world every day. Traditionally, once the satellites had captured the images, Airbus would process them and download them into the company's library. From here, customers would choose the images they wanted from a catalogue and then several hours later, they would receive them.

Over time, as technology grew more sophisticated and Airbus added to its fleet of satellites, it built the capacity to provide better quality data and imagery at increasingly large volumes. However, its existing solution could not speed up the production and delivery of its image and data products to meet the growing expectations of its customers.

Airbus decided to create a new platform, called OneAtlas. that would provide customers with the images and data they needed as quickly as possible without compromising on quality or the range of coverage. In addition, the specialized type of imagery that Airbus provided meant that customers had to have the right technical capability and capacity to receive and use it. With the new platform, Airbus could innovate with different image types and solutions to enable smaller organizations to use the company's products. "We really wanted to democratize access to our satellite imagery," says Jean-Michel Darroy, VP Head of Services Growth at Airbus.

Airbus trialed seven separate cloudbased options for the OneAtlas Platform. It chose Google Cloud Platform as the winning solution, largely because of its facility with deep learning and image processing, the Google team's customer service, and robust security models. "Google has an impressive reputation for security and that was key for us," says Laurent. As a key component of OneAtlas, Cloud Storage holds hundreds of terabytes of data and imagery that's easily accessible in the cloud and doesn't require provisioning and maintaining large banks of servers. The first component of OneAtlas released was the Basemap product,



found the managed services to be very efficient and effective for delivering high-level information to our customers. Google Kubernetes Engine, in particular, is really the heart of our system now." Laurent Gabet, Optical R&D Manager, Airbus

which allowed customers to stream images of the whole world instantly or download them at a range of different resolutions depending on their needs. This demanded extensive data capturing. In addition to its own wellhoned image-processing techniques, Airbus trained deep learning algorithms in TensorFlow to recognize cloud cover. After switching to TensorFlow, Airbus found that its error rate for detecting clouds dropped from 11% to 3%.

To process the images, Airbus relied heavily on Google's managed services. With Google Kubernetes Engine orchestrating the various methods used to extract information from the images, the company could scale its compute power up and down as demand increased and decreased. Cloud Pub/ Sub was used for messaging and the data was held in Cloud Datastore, for easy scalability.

With the images processed, Airbus extracted the data and placed it in the existing library. From here, the customer could access the imagery as part of a seamless, connected digital atlas for streaming or downloading. Airbus also wanted analytics to provide high-end services to complete the offer for the benefit of the customer.

Focusing technologies, broadening horizons



With Google Cloud Platform, Airbus has built a highly secure, cloudbased platform, capable of delivering data and imagery to its customers at unprecedented speed. Customers can now stream images with less than a half-second delay, compared to a wait of hours or even days with the previous system. The robust, global network of Google helps ensure that the OneAtlas platform can deliver the same highquality service to its customers wherever they are in the world.

Meanwhile, Airbus has been able to take advantage of a highly scalable storage solution, adding millions of square kilometers of imagery every week. This currently amounts to 500TB of data per year, but with the planned addition of more satellites and high-altitude drones, the company expects to add 2PB annually.

The new platform also enables Airbus to make its image products much more affordable for smaller organizations, such as NGOs or farmers who can take advantage of newer, lower-cost options like streaming data for a limited time or only paying for the images they use, instead of more traditional subscriptions models. "We have access to new types Google Cloud Platform gives us access to much more compute power than we had in the past, so we can do so much more than we used to. Back then, we worked on projects. Now the whole world is our playground.

Laurent Gabet, Optical R&D Manager, Airbus

of customers now who might not have been able to buy satellite imagery in the past," says Jean-Michel. For Laurent, as impressive as the technical benefits are, it is the scope of Airbus' ambitions that have been most greatly affected.

Thanks to the scope and flexibility of Google Cloud Platform, Airbus Intelligence is hard at work on a range of additions to OneAtlas which include expanding its Data as a Service offers beyond the Basemap service to include more high-resolution imagery, elevation data, and automated change detection. Other services will include industryspecific analytics services for Agriculture, Maritime, and other markets. In addition, it will add a Software as a Service imageprocessing tool, a data-led product built from analytics running on satellite and drone imagery and, finally, a Platform as a Service offering to allow its less specialized customers access to some of the company's own tools and even some third-party analytics.

As well as perfecting its current offerings, the Airbus Intelligence has also been looking to the future, exploring new tools such as G Suite, to optimize its internal communications, and TensorFlow to evolve new techniques in remote sensing with deep-learning models. According to Laurent, this kind of data extraction, designed to identify objects such as land and sea vehicles, would have been more difficult with traditional methods.

"Back when we were still deciding on which solution to use, we felt that Google had the clearest roadmap for this kind of technology," says Laurent. "Deep learning has been a real problem solver for us, and Google Cloud Platform provided just the right solution to help meet our market needs."

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