



# ENHANCING CUSTOMER EXPERIENCE WITH DATA-DRIVEN AUTOMATION

**IMPACT**

- Over 50% data volume reduction
- Onboarding engagement timelines reduced from 6-9 months down to one month through automation
- Data that used to take 6-7 weeks to find, has now been shortened down to one week
- Ingesting 75,000 events per second into the data lake

This major airline is one of the largest in the world and is based in North America. The company uses mission critical data to drive decision making and optimize its business. This includes sensor data from aircraft, clickstream data, and operational information, such as scanned boarding passes, to influence actions throughout the organization. Having the right data available in a timely manner offers unique opportunities for the airline.

By using sensor data pulled from aircraft upon arrival, maintenance workers in the hangar benefit from predictive maintenance. This prevents unplanned part failures, which helps prevent flight delays, and also enables an optimized supply chain with parts and labor. For clickstream data, the airline can analyze customer interactions with the website when they're online looking for flights. Based on the customer decision making process, promotions can be offered when the time is right - ensuring flights are at full capacity thus maximizing profitability.

"The initial vision was how we could enable significant and high speed data transport, supporting a variety of business objectives. Whether it's customer oriented, airport operations, cybersecurity, or in support of availability and application performance objectives," said an executive from this major airline.

The company also has a responsibility to provide safety to customers - in the form of safe travel, as well as protecting customer records. This leads to a strong focus on cybersecurity, responding to potential attacks, and California Consumer Privacy Act (CCPA) regulatory compliance.

"It's exciting to be a part of a company where you can see that the work you're doing every day directly ties into a passenger flying and creates a better experience for them," said an engineering manager from this major airline.

**Utilizing data to create a better customer experience**

With so many opportunities for how data could be used to improve the business and the customer experience, the challenge became how to remove data silos and aggregate data to gain access for enterprise solutions.

"We wanted to gain a better understanding of the customer's journey. What are all the different places they engage and what are the outcomes of those touch points? Whether it be clicks on the website, buying tickets, checking in for flights, interacting with gate agents, in-flight entertainment - there is a whole chain of custody from beginning to end. We wanted to figure out how each of these interactions could be improved," added the engineering manager.

While the organization was focused on creating a better customer experience, the foundation needed to be established first.

"The bottom line was how do we aggregate all the data necessary? You need an easy to consume mechanism for linking disparate systems together and getting data into the platform. We had to focus on our 'plumbing,' how we were going to get all this data flowing in an easy way for application teams as well as how do we get a platform that is scalable to handle that flow and volume. A lot of people want to jump straight into advanced analytics without taking care of the foundation first," said a manager of cybersecurity engineering.



# 40%

Up to 40% reduction of public cloud network data charges

The major airline needed to solve its data movement challenge, connecting all data sources into its platforms to do analytics at scale. Once this foundation was built, the organization would be able to understand customer behavior, while providing better reporting and aggregation for agent technology teams. It would also remove silos for cybersecurity data, which supported the push for PCI compliance, and customer data privacy.

### Solving the data movement challenge

This airline turned to Cloudera to help solve this data movement challenge. Cloudera DataFlow with Apache NiFi and MiNiFi became the foundation for ingesting all data across the organization, including networking and server logs from all devices, which were then routed to cybersecurity platforms and other applications. The company has multiple data lakes that serve different purposes and they all feed off the same data 'plumbing.' By solving the challenge of data movement, the resources and focus could be turned to analytics.

"The benefit we've seen from solving our 'data plumbing' challenge is that we can focus our efforts from a financial standpoint. It's hard to advance as an organization with divided focus. Now teams can show up with their data and use cases, and our environment is robust enough to handle all the processing in one single system. This enables us to actualize more advanced use cases," stated the cybersecurity engineering manager.

The data is primarily touched by four teams: the cybersecurity team, AI operations, enterprise log management, and business intelligence. NiFi was chosen because it could stream data from a wide variety of sources into the processing platform in an easy and timely manner. This allowed the organization to centralize how the data was moved, and democratize so that teams don't have to define their own unique service or endpoint. Without NiFi, this would have been much more complicated and drawn out.

"We had deployed NiFi clusters in all of our data centers, to be used as our log transport utility service at an enterprise level for both on-premises and in the cloud. We toted it as an enterprise pattern for moving data in near real-time at scale. We reached a critical mass where we would've needed to hire more talent to maintain the system internally. Partnering with Cloudera made much more sense for us - for expertise, guidance, and support. CDF was the launching pad that allowed us to focus on the next step," added the cybersecurity engineering manager.

"CDF with NiFi helped us provide a common solution between technology risk management, availability, system monitoring activities, and cybersecurity. That crossover is a bit unique, typically cybersecurity and monitoring tools only focus on one specific function. Cloudera has allowed us to simplify the application environment. Instead of having to send logs multiple places, application teams can send data to one place. Not only do we get the benefit of simplicity from an application perspective, but also from a network efficiency perspective," said the executive.

### Providing onboarding automation through NiFi

The operations team wanted to automate the data pipeline onboarding process, enabling new teams to self-service and get the most value out of the wealth of data that was available much more quickly. The idea was to enable other teams to set up an end-to-end pipeline of data movement as quickly as possible. Leveraging templates, the operations team was able to set up an endpoint rapidly in NiFi, collect the log data or other data streams easily through the flow and push it to its destination. If any customization was required, it was very easy to change the flow using the drag-and-drop capability of NiFi. The operations team has been able to maintain control through its versatility, making the onboarding process much simpler, automated, and consistent. Previously, these onboarding engagements would take 6-9 months to set up an end-to-end flow, but now can be executed in less than one month.

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Executive from major airline in North America

"Our previous solution was difficult to use and it wasn't reliable, so if a job stopped running we wouldn't know about it until 24-hours later. With NiFi we actually saw the data moving and we could validate within a few clicks - it eliminated all of the mess," said the cybersecurity engineering manager.

Automation has already been paying dividends and increased speed. As the major airline is gearing towards larger initiatives around customer experience management, the key has been to enable teams to be more agile with data. An important driver for that has been immediate access to relevant data for making the right decisions. Data movement automation has been critical in determining the success of various teams with their data needs. Automation has helped with reducing the time it takes teams to gain access to their data significantly and thereby boosting their time-to-market with their initiatives.

"One of our big corporate initiatives is automation wherever possible. CDF and NiFi allow us to test different ideas quickly, see if those ideas are effective, and then make decisions," said the engineering manager.

### Cybersecurity, PCI compliance, outside threats

The cybersecurity team is motivated by PCI and regulatory compliance, protecting customer records. Auditors review and grade organizations based on meeting these standards. Obtaining unsatisfactory scores would reflect badly on the airline and its leadership, while leaving the business more exposed and threatening relationships with partners, vendors, and customers. There are also financial implications for breaches, including fines imposed by the government. By maintaining a top score and showing continued improvement, an organization demonstrates trustworthiness, confidence in its leadership, and an excellent customer experience.

"We take compliance very seriously and are working hard to establish the utmost data integrity. We're building a culture where everyone wears the hat of cybersecurity, showing all the best practices. We write applications from the ground up with this foundation in mind, building them to be robust. In this way we are being more proactive with our approach," said the engineering manager.

Having a scalable data architecture has enabled the major airline to start exploring new possibilities within the security space. Rather than simply meeting the minimum compliance mandated data points, the company can now look at application logs or security events outside of regulatory compliance, correlating multiple data sources, to understand potential threats even better. What used to take upwards of 6-7 weeks to find data, has now been shortened down to one week as a result of using NiFi.

"We're now spearheading threat intelligence driven decisions. Gathering all this data is great, but there's so much that we don't have the processing to look at every single event and look for every indicator of compromise. Now we can be more targeted, for example, if we saw a particular threat actor had targeted a different part of the business within the last month, we may want to take those IP addresses of those malicious indicators and throw that into our own analysis to see if there's similar activity within our own network. This helps us to hone in our efforts and resources on the highest priority items," said the cybersecurity engineering manager.

### Results

By embarking on this digital transformation, the cybersecurity team was able to gain more understanding of the logs and how customers and internal users are using applications. The operations team is focused on preventing equipment downtime and revenue loss, ensuring on time departures and arrivals, avoiding delays for customers and helping to keep airport employees more productive. Their focus was on making the tools easy to use, so other teams can bring in their data and ideas. Implementing CDF and NiFi also enabled this major airline to centralize data movement, now ingesting 75,000 events per second into the data lake.

**About Cloudera**

At Cloudera, we believe that data can make what is impossible today, possible tomorrow. We empower people to transform complex data into clear and actionable insights. Cloudera delivers an enterprise data cloud for any data, anywhere, from the Edge to AI. Powered by the relentless innovation of the open source community, Cloudera advances digital transformation for the world's largest enterprises.  
Learn more at [cloudera.com](https://cloudera.com)

Cloudera also reduces the load on other systems. For example, NiFi is being used to parse, filter and prioritize logs to be sent to Splunk Indexer. By leveraging the backpressure monitoring and rate limiting capabilities of NiFi, the teams were able to realize that they were actually sending excessive amounts of data into such log management solutions. One team had declared that they were sending only 1 GB of data into Splunk but soon, realized that they were actually sending 10 GB of log data every day. Using NiFi's parsing and filtering capabilities, they can reduce that data significantly to send in only the most relevant data.

"The simplicity to the application teams has been a huge benefit. Now they can have a clear understanding of how to configure logs and where to send them. Having a unified answer makes it a much better message and means we have better visibility and coverage. Leveraging NiFi to parse data and send what we need in a highly compressed manner results in reduced network utilization, and reduced public cloud costs," said the executive.

By using NiFi to parse data and send only what is needed in a highly compressed manner, the major airline has seen an over 50% data volume reduction because they aren't having to pay for data streams to transmit twice. The organization has also seen a 30-40% reduction of network data charges for public cloud.

"When operating in public cloud you have cost efficiencies because you're not duplicating the transaction from the kiosk or application, getting it back to the backend. We're able to take one stream and send it where we need to, in a network and cost effective manner. We were able to bring worlds together that historically didn't necessarily cooperate using a common solution set," added the executive.

The savings is enabling the major airline to expand coverage without having as significant of a dollar impact, which allows it to expand beyond its original objectives into areas that help improve the overall situation awareness of application and infrastructure availability and performance.

**Future opportunities**

Enabling high speed data transport in a reliable and performant manner to support business objectives has been a huge step in building a strong foundation for the major airline. The organization continues to focus on utilizing data-in-motion and shifting more workloads to the cloud. By continuing on this journey of digital transformation, the airline will continue to create a better experience for its customers. It sees this manifesting in a number of ways.

First, at the kiosk level. Upon check-in, real-time offers like upgrades or in-flight coupons can be provided at kiosks based on the customer and their past experience. Eventually, the data will be available to provide comparison analysis on the number of ticket increases that occur when providing real-time promotions for customers. This directly provides a better customer experience because the airline can be more in tune with customer needs. Health checks can be conducted to make sure kiosks stay online, which means less agents will be required to monitor them.

Second, the planes themselves. An additional project will be collecting logs from aircraft in real-time using MiNiFi. To comply with FAA regulations, the data will be made available as soon as the plane lands. This leads to less flight delays. Data also can be pulled from the laptops used by maintenance engineering workers for predictive maintenance and compliance. By consolidating all data into a single analytics platform and increasing coverage across the organization, the opportunities are endless for creating a better customer experience.