FlightStats processes millions of messages per hour, sharing information with customers in near real time

FlightStats:

Size: 75 employees

Industry: Data services for aviation

Location: Portland, Oregon

United States

Solutions

- Deploy FlashStack converged infrastructure to improve performance and reduce costs

- Integrate FlashStack with Amazon Web Services to build a hybrid cloud, optimizing data processing and distribution

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FlightStats, part of FlightGlobal, operates a thriving business providing real-time and historical flight information to companies and individuals across the entire travel ecosystem. "We tell the story of a flight: what's expected, what's happening now, and what happened," says Chad Berkley, FlightStats' chief technology officer.

Challenge: processing a flood of flight-related data

Ingesting, processing, storing, and sharing data from nearly 100,000 commercial flights each day puts a heavy load on servers, networks, and storage. In this case, the data challenge isn't size. In fact, 15 years of flight data amount to just 8 TB. The real challenge is message volume. Millions of messages per hour flow into the company's data center from airlines, airports, ticketing systems, aircraft transponders, positional systems, weather systems, and many other sources. "We need to process a constant stream of small messages that flow in at a fast rate," Berkley says. "It's a flood."

As the business grew, FlightStats' physical servers began to buckle. To improve performance and reduce costs, the company decided to virtualize its servers. "We needed an affordable platform to take data in, make sense of it, and make

it available to our customers," says Alex Witherspoon, FlightStats' vice president of platform engineering. To prevent business interruptions, the company wanted "redundant everything." To process data in real time, FlightStats needed huge amounts of memory—100 GB or more for every virtual machine.

Converged infrastructure and hybrid cloud for a competitive edge

FlightStats built a hybrid cloud using FlashStack converged infrastructure and Amazon Web Services (AWS). The private and public elements each do what they do best. Heavy workloads run on powerful FlashStack, built from Cisco UCS blade servers, Pure Storage, and VMware. "Cisco UCS has a novel ability to assign up to 3 TB of memory to each server," says Witherspoon. "We run 239 virtual machines on just 5 blade servers." Pure Storage can ingest millions of messages per hour. The public cloud portion, AWS, distributes data to customers via the website, mobile apps, and APIs.

Up-to-the-second data and great SLAs

FlightStats efficiently processes millions of messages an hour, arriving at rates ranging from megabits to gigabits per second. "Customers choose FlightStats

With Cisco UCS, FlightStats:

Attracts customers by providing near real-time flight data

Lowers costs with 239 virtual servers operating on just 5 server blades

Scales to collect more data and serve more customers

because we get them more current data, faster," Berkley says. "FlashStack is as close to real time as you can reasonably get, because of its bandwidth and fast reads and writes."

Processing is faster, too. FlightStats developers build applications from tiny, reusable building blocks called microservices. The microservices can reside on any server in a Cisco UCS chassis because of the low latency of the interconnect. "We take pride in our code, and Cisco UCS does it justice by making it speedy and reliable," says Berkley. The company now outperforms its 99.8-percent SLA and is considering increasing it to 99.9 percent.

Simple deployment, simple management

FlashStack was up and running quickly. All servers in the chassis connect to Pure Storage through just four cables. "With FlashStack, we didn't have to learn the nuances of many different systems and the cables that came with them," Witherspoon says.

Cisco UCS Manager helps to keep the data center humming by sending server health information to the FlightStats application monitoring system. "If transactions slow down, we can quickly see why, and take action to correct it before customers are affected," says Witherspoon.

Ready for more data from the Internet of Things

FlightStats will later capture data from plane engines, which generate .5 GB per flight. With FlashStack, scaling is as easy as inserting new servers and adding more flash memory to Pure Storage. Growth won't interrupt the business.

Another plan: use Cisco UCS C-Series Rack Servers as Docker hosts. An active-active disaster recovery architecture is also in the works.

Berkley concludes, "Our chief asset has always been smart people writing code. With FlashStack, those smart people are even more valuable because their code runs better on Cisco UCS and Pure Storage."

Products and Services

Unified Computing
FlashStack Converged Infrastructure

- Cisco UCS 5108 Chassis
- Cisco UCS B230 M4 Blade Servers
- Pure Storage
- VMware vSphere

Cloud and Systems Management

- Cisco UCS Manager

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