Software development drives efficiency across the global supply chain

Opportunity

GE Transportation helps move people and goods all around the world. Their software does a lot of the heavy lifting by providing customers with forward-looking solutions designed to improve the flexibility, efficiency, and scalability of their transportation systems.

GE Transportation Digital Solutions CTO, Wesley Mukai, manages a platform group responsible for creating the cloud development environment for the hundreds of developers and engineers in the organization. The customer-facing applications Mukai’s team creates serve the railroad, intermodal transport, and mining industries—blending the latest ideas in flexible cloud-bases strategies with, what are in some cases, old and entrenched legacy systems.

“We’re engineering a modern cloud stack built on Kubernetes and DC/OS that will be designed for transportation specifically. Our cloud engineering and DevOps experts are setting up, architecting, and building cloud solutions for both public and private cloud use cases, and it’s a lot of work. We’re placing and migrating a dozen new and legacy applications and looking to speed up the pace of development as we go.”

— Wesley Mukai, CTO, GE Transportation Digital Solutions
Imagine a large rail freight operation with thousands of locomotives and freight cars passing through hundreds of yards and terminals, as they travel thousands of miles carrying thousands of tons of freight. The software that manages and optimizes the intricacies of such an ecosystem can be a mix of legacy applications, Java-based on-prem applications, and modern cloud-native solutions.

To enable the development of these solutions, the team at GE Transport needed to build a “container-as-a-service”-centric platform that could support industrial applications in a cloud-agnostic and portable way. The companies the team codes for need to blend incoming data from a wide variety of enterprise and on-asset sources—sometimes from locomotives via IoT devices. The team then needs to take the desperate data and bring it back to a cloud environment—making sure the data can be used to drive analytics, network optimization, and transport logistic applications.

“We can build an application that lives in a public cloud setup, but if our customer wants to run it on-premise, we want to make sure they can do so in a lightweight, cost effective fashion. We provide them with a reference design, and they can stand it up themselves. In the future, our goal would be to create a more hybrid setup, with portability across different clouds and seamless on-premise portability. That’s an area where D2iQ can really help us.”

—Wesley Mukai, CTO, GE Transportation Digital Solutions
Solution

Mukai’s team wanted to move beyond their Java-centric development stack for on-premise applications, and improve upon their traditional three-tier SaaS applications. The plan was to start to containerize as much as possible and provide a modern development platform to support side-by-side both the cloud native applications and the traditional applications.

The team has been working with DC/OS to power their cloud services platform, including Kubernetes on DC/OS, with AWS as the current services provider. That platform enables the team to provide a more self-service environment for their development teams to independently develop, test, and deploy applications serving customers within GE Transportation.

By deploying DC/OS, GE Transportation can achieve:

- **Developer self-service and enablement**
- **Centralized operations team management**
- **Increased service uptime and reliability**
- **Reduced mean time to recovery (MTR)**
- **Certified NIST security and privacy controls**

For the team, the decision to go with DC/OS had a lot to do with market timing. They knew they wanted to use Kubernetes, but they also knew they needed help to get it up and running and to manage the lifecycle. “Maybe three years from now the Kubernetes ecosystem will be very clear, but for us, D2iQ was the company that provided the right balance and open approach.”

Containerized software development using Kubernetes and DC/OS helps GE Transportation transform their clients’ businesses to take advantage of cloud-scale architectures while managing industrial operations with new levels of efficiency.

“If a customer operates 30 terminals, then it may have 30 instances of an on-premise application running, and that’s very inefficient,” said Mukai. “So even on-premise we want the software to be more consolidated and run more like a private cloud. Doing so makes it much more scalable when, say, the customer adds a 31st terminal to its operations.”

The DC/OS platform makes it easy to move data and applications out of traditional and expensive data centers to whichever cloud service provider happens to be optimal at the moment. That kind of agnosticism and lack of lock-in is a big customer win.

GE Transportation is also looking forward to taking data analytics to the next level, working with D2iQ as machine learning, big data management, and AI become more prevalent. “We have a whole bunch of data analytics use cases in mind,” said Mukai.
Mukai noted that every GE Transportation customer wants to improve its operations, manage its performance better, and be ready to compete in an industry that is cyclical in nature and often subject to a dizzying array of ever-changing regulations ranging from safety to security. Responding to customers quickly and complying with data-related regulations transparently requires a new level of control over data collection and analysis—the exact functionality that a DC/OS development environment offers.

“We’ve been really happy with D2iQ,” said Mukai. “Whether it’s the scoping of licenses, figuring out what we need to buy, being flexible given our changing timelines, or working deployment with our technical team and road map with our product team, D2iQ has been very responsive. It’s so valuable to us to find experts in Kubernetes and data services who are willing to spend as much time as it takes and even fly halfway across the country to answer our questions in person.”

Going forward, GE Transportation plans to continue to work with D2iQ to manage Kubernetes in an enterprise-supported fashion.

“We find a lot of value in having an enterprise-supported environment for our work with Kubernetes,” said Mukai. “D2iQ is a thought leader that brings practical problem solving to our implementation challenges.”

“D2iQ was a good starting place for us because we needed a team with a track record of getting projects and products into production and an installed base of customers and partners that we could leverage.”

—Wesley Mukai, CTO, GE Transportation Digital Solutions

Results