# RF-SMART Goes Serverless to Further Support Global Reliability

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## Executive Summary

RF-SMART is a developer of mobile supply chain technology that gives companies clearer insight into their inventory management operations. With RF-SMART's solution, supply chain leaders can improve accuracy and visibility related to inventory levels, as well as automate manual processes to improve warehouse productivity. RF-SMART offers mobile solutions for five main sectors, including distribution, manufacturing, retail, eCommerce, and healthcare. Since 1982, the organization has helped over 1,000 companies optimize their supply chains.

ClearScale recently stepped in to help the mobile tech developer take advantage of serverless cloud architecture for one critical application. Now, RF-SMART can continue to serve its expanding global client base and facilitate high-quality customer experiences at all times. The organization also has an expert partner in ClearScale to continue working with over the long term.

> "The ClearScale team has enabled us to quickly meet our needs for increased reliability of our application. This allowed our development teams to continue their focus on the application's functionality, which transforms our customers and changes lives."
>
> **David Lomneck,** Director of Development – NetSuite, RF-SMART

## The Challenge

Distributors, manufacturers, and retailers all over the world rely on RF-SMART's suite of advanced software solutions. RF-SMART wanted to ensure no matter their geographic location, each customer received the same reliability from their WMS at all times. Doing so would reduce inventory management risk for clients and minimize disruption should any one region experience technical difficulties.

On top of that, RF-SMART wanted to reduce its exposure to deployment errors by implementing an automated continuous integration/continuous delivery (CI/CD) pipeline.

RF-SMART knew it had to further invest in its IT infrastructure to make these improvements. Specifically, the leadership team wanted to implement serverless architecture for two different APIs, Token Client and License Service, which are both consumed by NetSuite devices.

RF-SMART decided to bring in outside help to refactor the License Service application, migrate production, and automate the CI / CD pipeline. As an Amazon Web Services (AWS) Premier Consulting Partner with extensive serverless experience, ClearScale fit the bill perfectly. On top of that, ClearScale offers staff augmentation services, which was ideal for RF-SMART, as the company wanted to refactor the Token Client API internally with help on an as-needed basis.

## The ClearScale Solution

Due to RF-SMART's global footprint, ClearScale's solution for the License Service application had to be reliable anywhere in the world. As a result, the ClearScale team designed an architecture that supports multiple regions simultaneously with geolocation and failover routing.

RF-SMART users are now always served within the region that provides the lowest latencies available. Should one region experience a catastrophic event, clients are seamlessly switched over to another until the original is back up and running.

On the CI/CD front, ClearScale developed a CI flow diagram and mapped out a CI pipeline with the following capabilities:

- Blue environment deployment (Serverless-Deploy-Blue)
- Green environment deployment (Serverless-Deploy-Green)
- Blue and Green environment switching (Switch-to-Blue or Switch-to-Green)
- Environment checking for DR via Route 53 service (Check-Current-Environment)

AWS CodeDeploy and AWS CodePipeline were both instrumental for this part of the project. AWS CodeDeploy automates software deployments to various cloud computing services, including AWS Lambda, which ClearScale implemented so RF-SMART can run code without provisioning servers.
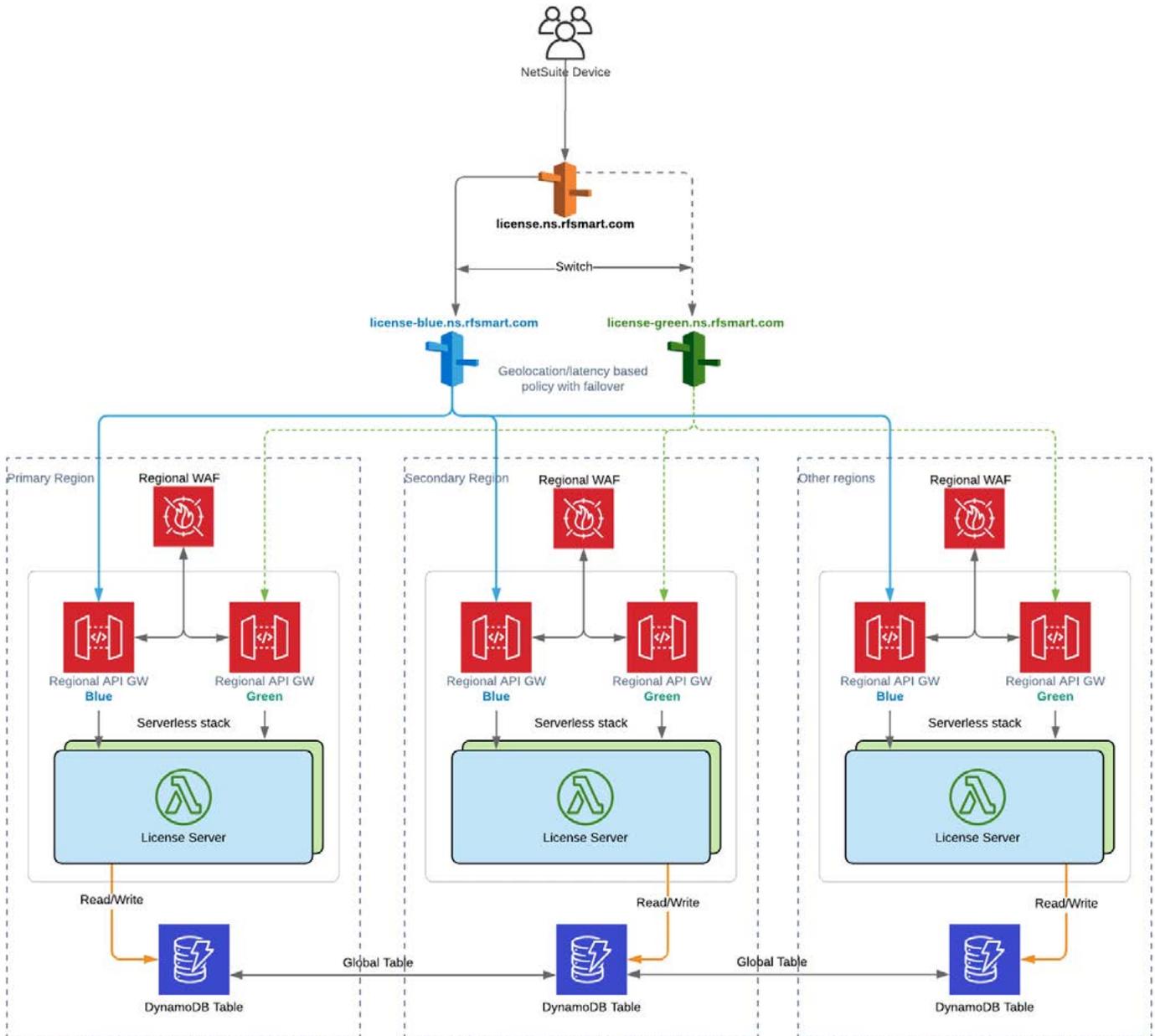
AWS CodePipeline is a fully managed service that enables users to automate release pipelines for application and infrastructure updates. Any time there is a code change, RF-SMART's application automatically executes the build, test, and deploy phases of the release process.

The new License Service application and underlying infrastructure is also designed to handle Blue / Green deployments. ClearScale set up non-production deployment to serve as a development environment. The development environment is the only one that can be redeployed.

To guard against accidental updates to the current production deployment, RF-SMART has to manually start a special task that switches DNS records between Blue and Green deployments. ClearScale also configured embedded checks that restrict updates only to the current production environment.

For the database layer, ClearScale proposed using Global Tables with Amazon DynamoDB, a flexible NoSQL database service designed to scale to any size. With DynamoDB, users can achieve single-digit millisecond performance with a fully managed, multimaster, and durable database. ClearScale used the cloud service to set up async replications between regions, further increasing the reliability of RF-SMART's mobile inventory management solutions.

## Architecture Diagram

# The Benefits

Thanks to ClearScale's engagement, RF-SMART can continue to provide a highly available, reliable, and extendable serverless solution. RF-SMART's revamped serverless architecture takes advantage of managed AWS services and focuses computing power on application logic rather than on infrastructure management.

Using an Infrastructure as Code (IaC) approach, ClearScale empowered RF-SMART to add, modify, and update resources quickly as needed. The mobile tech developer can also spin up an entirely new infrastructure in AWS if necessary. Additionally, refactoring the License Service API established a roadmap for refactoring other applications in a similar way.

"The ClearScale team has enabled us to quickly meet our needs for increased reliability of our application," said David Lomneck, Director of Development at RF-SMART. "This allowed our development teams to continue their focus on the application's functionality, which transforms our customers and changes lives."