Designing Improved and Fault Tolerant Architecture Following AWS Best Practices

rfsmart®

Executive Summary

Managing logistics is an incredibly challenging task. Whether a company needs to coordinate resources to manufacture a product or process returns at a fulfillment center, every step in the supply chain needs access to accurate, up-to-date information. This information is often collected by employees directly at the ground level, physically or electronically tracking items throughout the manufacturing and distribution process. To better manage their resources and business activity, many suppliers turn to enterprise resource planning (ERP) software to help coordinate these tasks. But many ERP systems often need additional support to help warehouse and shop floor workers collect data and manage inventory.

RF-SMART takes over where ERP systems leave off, offering supply chain companies SaaS products for warehouse management, as well as consulting services for warehouse design. Across the manufacturing, warehousing, retail, eCommerce, and healthcare industries, RF-SMART uses barcode technology to provide employees with real-time access to information and validation of data. The result is a supply chain operation with enhanced visibility into work performance and better traceability of products and projects, lending insights into who, what, where, when, and why activities are taking place in a warehouse or floor shop. RF-SMART's technologies are purpose-built to work with leading ERP systems like Oracle NetSuite, Microsoft Dynamics AX/365, Oracle JD Edwards, and Oracle SCM Cloud.

> "The ClearScale team enabled us to quickly meet our needs for increased flexibility and reliability of our application. This allowed our development teams to continue their focus on the application's functionality."
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> **Matt Stueck,** CTO, RF-SMART

The Challenge

RF-SMART for Oracle SCM Cloud provides supply chain companies with automated data collection, inventory management capabilities, and full ERP integration. The product was deployed to AWS in a staging environment, as well as two U.S.- and E.U.-based production environments. Even though their product was already up and running in AWS, RF-SMART wanted to make sure it was following AWS Best Practices and DevOps principles to run their operations as efficiently as possible and to enable disaster recovery capabilities.

RF-SMART partnered with ClearScale, AWS Premier Consulting Partner, to move their production workloads to an architecture that follows AWS best practices and DevOps principles, and one that incorporates their desired disaster recovery and security capabilities. ClearScale's task was to design an improved, highly available, scalable, and secure architecture that conforms to AWS Best Practices. With the new architecture, ClearScale could also help RF-SMART implement a complete continuous integration and delivery process to build and deploy their application and develop their desired process of fully automated disaster recovery.

The ClearScale Solution

ClearScale carefully gathered RF-SMART's requirements, paying attention to particular details in their existing AWS infrastructure. After a detailed analysis, ClearScale's engineering team created a new infrastructure design, developed automation tools, and deployed RF-SMART's staging infrastructure. ClearScale also helped RF-SMART get familiar with the new automation tools before deploying and testing their customer-facing production infrastructure.

RF-SMART's new AWS infrastructure employed Amazon S3 storage for high scalability and reliability and AWS Identity and Access Management for enhanced security. Autoscaling Groups with Windows-based EC2 instances running applications for elasticity and added resiliency. The Amazon Relational Database Service (RDS) was chosen for its AuroraDB MySQL database clusters, setting up three separate RDS instances for Staging, U.S. production, and E.U. Production. To assist with automation, ClearScale used AWS CloudFormation to deploy the Jenkins continuous integration server.

ClearScale also designed and deployed a Disaster Recovery infrastructure with a fully-automated failover procedure. Leveraging the "pilot light" disaster recovery method, two identical VPCs — one for production and one for disaster recovery — were each placed in a separate region. Using active replication in RDS and S3, data in the disaster recovery region was always ensured to be up-to-date. AWS Lambda was also implemented to automate backup and restore procedures.

VPC Diagram
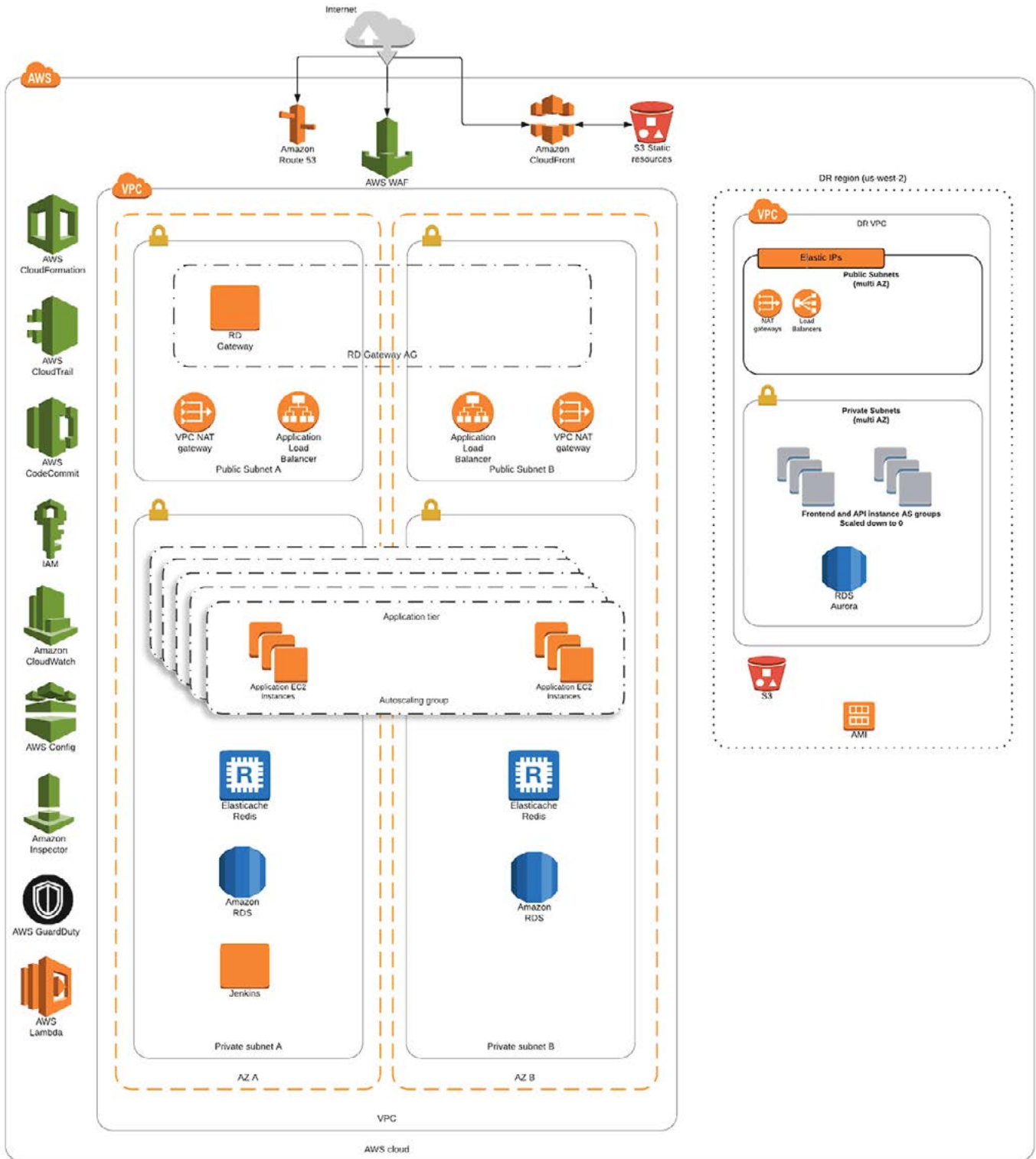
The Benefits

Even though they already relied on AWS for its infrastructure needs, ClearScale's new AWS architecture transformed RF-SMART's operations into a more efficient and streamlined operation that adheres to AWS Best Practices. Investing in a stronger, better structured architecture helps RF-SMART be ready to meet customer demands, better implement new features, and scale when necessary.

Since partnering with ClearScale, RF-SMART has been able to take advantage of architecture that offers better automation, reliability, and flexibility. Thanks to improved scalability implemented by ClearScale, RF-SMART can now migrate U.S. and E.U. production workloads to new environments when necessary. RF-SMART also uses fully automated processes to deploy their application quickly, reliably, and in more regions than before, thanks to new solutions for provisioning, deployment, and continuous delivery and continuous integration workflows. Through its new Advanced Disaster Recovery automation, RF-SMART can now make sure client data won't be lost, and in the event a primary region unexpectedly goes down, their application will continue to operate.

RF-SMART's improved AWS foundation makes access to information faster and more reliable. Considering the need for accurate, real-time data in warehouses and supply chain manufacturers, making sure inventory can be tracked and accounted for as efficiently as possible is a winning formula for success.