How the cloud made the North Carolina Division of Employment Security more resilient

North Carolina's Division of Employment Security (DES) received nearly 50 times its usual claim volume at the start of the pandemic. But unlike many unemployment divisions, its system was able to withstand the additional traffic.

That's because DES had already upgraded its aging mainframe system to scalable cloud architecture.

A tidal wave of unemployment claims

In the week ending March 28, 2020, about 6.6 million Americans filed unemployment claims,[1] compared to about 216,000 two months before.[2] Due to the strain, unemployment websites in some states became unavailable.

In North Carolina, although new unemployment claims skyrocketed from 12,766 in February 2020 to 622,832 a month later,[3] residents were able to receive critical services. The DES website maintained consistent response time despite a roughly 400% increase in user sessions.

DES maintained status quo throughout the pandemic due to a modernization effort launched several years prior. It began with the establishment of the Southeast Consortium Unemployment Benefits Integration (SCUBI), an unemployment insurance software consortium launched in 2013. SCUBI's goal was to develop a solution to more rapidly assess, adjudicate, and process claims and meet surging load demands during a crisis.

From mainframe to modern

DES claim processing previously ran on a mainframe system. Built primarily in the 1970s and 1980s, mainframe systems are expensive to maintain and difficult to update, and can require hours of downtime for job processing.

DES moved to replace its aging system with a secure solution that could scale up and down as needed. Under SCUBI, the state partnered with Capgemini, an Amazon Web Services (AWS) Partner and leading provider of unemployment insurance modernization solutions and services.

DES initially implemented Capgemini's AcUlty, an enterprise-grade web-based platform designed for unemployment insurance, on on-premises infrastructure. DES leaders and Capgemini soon realized the cloud was a better fit for the platform and the system overall. AWS GovCloud was a natural choice.

"AWS is a robust, secure, and highly scalable platform," says Prasad Allampalli, North America state and local government and education (SLED) leader for Capgemini. "Our 10-plus year partnership with AWS allows us to work end-to-end in a seamless, integrated way to deploy a highly scalable, configurable, and automated system." In addition, the inherited security and compliance controls in the AWS GovCloud environment helps us meet our state and federal requirements."

Integrations for compliance and constituent service

AcUlty, hosted on AWS Cloud infrastructure, gave North Carolina an unprecedented level of security and flexibility. Operating in the cloud enabled AcUlty to scale up to 50 times the load during the peak of the pandemic.

The system's rules-based architecture enabled DES to quickly add requirements from the Families First Coronavirus Response Act (FFCRA) and the Coronavirus Aid, Relief, and Economic Security Act (CARES) without expensive bolt-on solutions. The architecture also allowed the agency to implement Pandemic Unemployment Assistance program updates in less than two weeks.

"We were getting new state and federal programs at a rapid pace, which required programming," says Crystal Pitts, DES chief information security officer. "We were able to meet those program coding requirements quickly. Because we were in AWS,

we were able to easily move from the development environment to testing to production, so the features were quickly available to claimants."

AWS also implemented Amazon Connect, an omnichannel cloud contact center service, to help manage heavy volumes of calls. This routed callers to a help desk where they would receive automated responses to commonly asked questions.

Solid security and fraud protection

North Carolina's unemployment program must comply with state and federal security requirements such as the National Institute of Standards and Technology (NIST) Cybersecurity Framework as well as the Federal Risk and Authorization Management Program (FedRAMP). Pitts says DES verifies security and compliance with AWS and Capgemini on an ad hoc and annual basis.

"We verify Capgemini is maintaining security of our environment through certification review as well as through vulnerability scans, compliance scans, configuration scans, and third-party security assessments," she says.

Allampalli says AcUlty has "information flow enforcement" to oversee how data flows between systems. It also abides by the concept of least privilege and provides detailed audit trails and role-based security to limit access to sensitive data.

Capgemini implemented a data privacy vault, which secures the data and the database. The technology encrypts data at rest and in use, which allowed Capgemini to migrate data without accessing personally identifiable information.

To help protect DES from fraudulent unemployment claims, Capgemini implemented a multidimensional model that addresses application, network, cloud, and data layer security. It also put mechanisms in place to stop payment on suspected fraudulent claims, pending investigation.

Pitts says DES has more control over its security than it did with its mainframe. "We can add more layers of security when we need it," she says. "We have multifactor authentication as well as authorization control and security based on user events."

Built-on controls in the AWS GovCloud along with AWS security services allow DES to have confidence in its security posture and add or make changes to prepare for an evolving security landscape, says Pitts.

Training the workforce

To ease the transition from the mainframe to the cloud and accelerate adoption, Capgemini, with the help of AWS, implemented organizational change management.

"To minimize typical roadblocks in training, we looked at the user journey and created blueprints based on how staff would experience the new system," says Allampalli. "We created a coach network and gave some staff virtual machines in the cloud, which makes change easier."

"We had the leads involved with Capgemini on a regular basis to learn about the system and understand the architecture," adds Pitts. "We also hosted AWS immersion days with our staff and have staff members pursuing AWS certifications."

A system to better serve people

Under SCUBI, North Carolina implemented a modern system that allows DES employees to serve the public more efficiently—no matter how high or low the demand.

"We have confidence we can scale up when needed and scale back and save money when needed," says Pitts. "It's imperative that we have a system that stays up to best serve what's often some of the most vulnerable people in the state."

The combination of enterprise-grade applications, a cloud-based infrastructure, and a rules-based architecture allowed DES to quickly implement new policies and other changes without bolt-on solutions. It also gave the agency multiple layers of data protection.

Capgemini currently provides managed services for DES, which includes security support, maintenance, enhancements, and updates. They work closely with AWS to make that happen, leveraging AWS Cloud native security capabilities like SecurityHub to enhance their visibility across the platform and provide continuous monitoring for security and compliance. Says Allampalli: "Our shared experience with AWS allows us to collaboratively agree and make calculated, forecasted decisions."

This piece was written and produced by the Government Technology Content Studio, with information and input from AWS.

1. *https://www.dol.gov/sites/dolgov/files/OPA/newsreleases/ui-claims/20200551.pdf*
2. *https://www.dol.gov/sites/dolgov/files/OPA/newsreleases/ui-claims/20200157.pdf*
3. *https://bi.nc.gov/t/COM-LEAD/views/RegionalUIDashboard/RegionalUIDashboard*

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