State of Maryland Stands Up COVID-19 Contact Tracing With Cloud-based Contact Center Solution

covidLINK System Rolls Out Across Maryland Jurisdictions Within Weeks

The Maryland Department of Information Technology (DoIT) provides technology solutions that enable the executive branch, state agencies, and coordinating offices to provide Marylanders with services to live and work more safely, efficiently, and productively. Importantly, the department established a long-range, target technology architecture, which encourages cross-agency collaboration and promotes best practices for operations and project management.

> "We're trying to save lives," emphasized DoIT Deputy Secretary Lance Schine. "With contact tracing, a much smaller number of people have to self-isolate. That allows for us to get back to some sense of normalcy without being clueless as to who is infected and unable to stop people who've been possibly exposed from going out and exposing other people."

Like other states across the country, Maryland needs to reduce the number of COVID-19 infections to flatten the curve. State leaders recognized the need for contact tracing: the process of reaching out to people who tested positive for the virus and alerting people who have been in contact with them. Contact tracing enables states to move from mandatory stay-at-home orders to a system in which people diagnosed with or exposed to COVID-19 stay home.

Start Fast, Implement Gradually

Lance Schine, DoIT deputy secretary, was asked to build the state's system for COVID-19 contact tracing, based upon his success modernizing systems at the Maryland Department of Human Services and developing the state's One-Stop portal, which consolidates Maryland's more than 1,000 licenses, permits, certificates, and registrations. The portal, built on Amazon Web Services (AWS), provides an intuitive search engine and a solid workflow capability for a consistent user experience on the front end and the ability to modernize on the back end without requiring users to learn a new system.

Within days of the contact tracing system request in late April, Schine and his team were demonstrating the new covidLINK system for Gov. Larry Hogan. In less than a month, it launched with a pilot in the city of Baltimore. By the end of May, all 24 jurisdictions were implementing the system. By starting with a pilot and rolling out gradually,

Schine and his team were able to fix bugs, incorporate new requirements, and update training material to provide for smooth onboarding and operation.

"Because of the flexibility of the system—it's very low code—we were able to make some important changes to the logic as we were rolling it out," Schine said. "That has made for much smoother adoption."

Powerful Cloud Technology Speeds Tracing

The covidLINK system incorporates COVID-19 test results and associated information captured in the Chesapeake Regional Information System for our Patients (CRISP). Maryland's health information exchange enables clinical information to move electronically among disparate health systems. Maryland used the Amazon Connect open platform to access CRISP data stored inside Salesforce, allowing contact tracers to self-serve and display details about who they needed to call. Maryland chose Amazon Connect as the virtual call center technology because of its features, scalability, and integration with Salesforce. To enable text messaging follow up, the state selected Polka Dot Sky Software for its software as a service alerts, enabled by Amazon Elastic Compute Cloud (Amazon EC2) and Amazon Relational Database Service (Amazon RDS), as well as AWS Key Management Service (AWS KMS) for data encryption.

Because covidLINK is comprised of numerous systems that work together as one, challenges with one system can be resolved without having to rebuild the entire system—speeding time to implementation. And, because the systems are in the cloud, the state's more than 1,000 contact tracers can work in isolation as if they are in one call center. "That's incredibly powerful in a pandemic," Schine observed.

Using Amazon Connect, contact tracers reach out to people diagnosed with COVID-19 by phone within 24 hours to begin a trace investigation. They see a record on their computer screen and call out to the person by clicking on their phone number. To increase the number of people who answer the call, every call uses the state's dedicated COVID phone number and caller ID: MD COVID. If needed, the automated system can call the contact tracer's cell phone and connect them to the person while maintaining the state caller ID and caller number. The system logs and records calls so staff can access them again if needed.

Based on the individual's contact history, contact tracers reach out to people with whom the individual had contact and provide guidance about monitoring symptoms and isolating at home. The contact tracer requests permission to opt contacts into the state's automated system for follow up. The system is designed to protect the privacy of citizens; contact tracers only tell each person that they were in contact with someone who tested positive for COVID-19.

The average interview time is 20 minutes. In recent days, the success rate for contact tracers reaching their target within the first 24 hours is between 80 and 90 percent.

"Virtually everybody has been cooperative and understands that this is not Big Brother," Schine noted. "It is the state trying to keep people from spreading the virus by telling people that they were with somebody who was positive. Without contact tracing, they would have no idea."

After the initial call, each individual receives a daily, automated text message asking how they are feeling. The system logs their responses in Salesforce. If a person describes symptoms that meet a defined threshold, the system will escalate the person's case and schedule him or her for testing.

The system was built to enable contact tracers to reach up to 11,000 new contacts each day. The automated text messaging system can text at a rate of 100 messages per second. In a week, hundreds of thousands of citizens receive texts.

> "It's like contact tracing on steroids," Schine said. "We're able to handle a very high volume of communication with a reasonable amount of contact tracers because the system has these automated features. Without this very flexible, powerful cloud technology, I don't know how this would have scaled, frankly."

Because all data sits in one location, the state can trace exposures across counties and seamlessly escalate as needed. In addition, the tracing system can replace existing ones for communicable illnesses such as E. coli and HIV. Previous contact tracing was executed using a collection of tools, from pen and paper to PC and server solutions.

Key Takeaways

When asked how he would advise others who need to establish a similar system, Schine noted that it's important to leverage modern technology tools that are already in use and can be configured to meet new needs. "There's no way we could have written this from scratch in a few weeks," he said.

If he had to do it again, Schine noted that he would sacrifice a little bit of speed at the beginning in order to stand up a transparent system for tracking bugs and feature requests. Doing so would save time overall, because it would de-duplicate requests and surface contradictory requests immediately.

He also advised, "It's important to have a strong leader who mandates statewide use of the system. If counties are using different systems, it's much more difficult to trace people, and therefore not as effective."

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