

Argentina's Ministry of Health builds national digital data network with Red Hat



Ministerio de Salud
Presidencia
de la Nación

Software

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Container Platform

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To improve patient experiences with universal healthcare, Argentina's Ministry of Health decided to build a national digital health network that would allow care centers to securely access patient data through standardized integration between providers. To establish a flexible yet stable IT infrastructure based on container and microservices technology, the Ministry of Health used Red Hat OpenShift, Red Hat Fuse, and Red Hat Ansible Automation Platform. Combined with modern development approaches like DevOps supporting collaborative, efficient work, the new infrastructure offers the scale and agility to support sharing of medical data for millions of patients over 24 provinces.



Healthcare

4,500 employees

45 million residents

Benefits

- Integrated medical data for more than 2 million patients across 17 provinces
- Gained responsive scalability to meet 1,200% increase in transaction volume
- Established protected, API-based data access, backed by community and Red Hat expertise

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Daniel Rizzato Ledo

Development Director, Health Information Technology Systems,
Argentine Ministry of Health



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Alejandro Lopez Osornio
National Director of
Health Information Systems,
Argentine Ministry of Health

Simplifying healthcare for all with national, digital data access

Under Argentina’s universal healthcare strategy, public healthcare is free and accessible to all citizens and residents – more than 45 million people across 24 provinces. But income gaps and distances to treatment centers make ensuring equal access to care challenging. To solve these challenges, Argentina’s Ministry of Health decided to build a national digital health network. Through this network, integrated with the latest health interoperability standards, care centers could securely access patient data from different providers to get a holistic view of a patient’s health history.

“Patients may wait for up to three hours at a health center or travel 50–60 kilometers to see the nearest doctor or a specialist. The national digital health network supports online scheduling systems and telemedicine for more timely treatment,” said Alejandro Lopez Osornio, National Director of Health Information Systems, at the Argentine Ministry of Health. “It’s also common for patients to be seen at one hospital but get tests done at another, or need to go to a private practice for imaging but then go to a public hospital for care. They had to take hard copies of their test results or medical history when they visited these different facilities.”

Building a national digital health network would let the Ministry of Health address complexity, data access issues, and performance challenges with existing health systems, but universal electronic health records require scalable, secure technology. The ministry’s existing databases were built on slow legacy solutions that could not be upgraded to provide the necessary scale or integration capabilities.

“The solutions that existed tended to be monolithic, large applications or networks. Each development stage took weeks, even months, greatly delaying time to market,” said Daniel Rizzato Ledesma, a doctor specializing in health IT and Development Director, Health Information Technology Systems, at the Argentine Ministry of Health. “We needed to automate the flow of public health statistics and management of the underlying systems.”

The Ministry of Health sought to establish flexible yet stable IT infrastructure based on container and microservices technology as the foundation of its national digital health network, with modern development approaches like DevOps supporting collaborative, efficient work.

Building a reliable, scalable IT foundation for integrated digital health network

During its search for a new infrastructure solution, the Argentine Ministry of Health focused on open source technology. “Open source is collaboration without borders. When a person creates code in any part of the world, it’s available to others who have the same problems, and people can work as a team to find a better solution,” said Rizzato Ledesma.

The Ministry of Health considered solutions from a variety of leading technology providers, such as Amazon, Google, and Microsoft. But due to government regulations, it needed a solution that could provide the right capabilities and performance while running on ARSAT (Empresa Argentina de Soluciones Satelitales Sociedad Anónima), the Argentine government’s main datacenter. Red Hat offered enterprise open source technology that met this need, backed by expert, hands-on support.

“Red Hat gave us the best in open source, with technology that is more reliable and scalable,” said Lopez Osornio. “During our Container Adoption Journey engagement, Red Hat’s experts worked with us from the start to define this project, build the architecture, and take that technological leap. Working with Red Hat Consulting and a Technical Account Manager really helped us succeed.”

The core of the IT infrastructure supporting Argentina’s national digital health system is Red Hat OpenShift Container Platform. Based on Red Hat Enterprise Linux and Kubernetes, OpenShift Container Platform provides a cloud-like experience with fully automated operations running on-premise on ARSAT servers. Running on OpenShift, Red Hat Fuse offers critical integration capabilities between healthcare providers’ databases and the Ministry of Health’s federated database system. Additionally, Red Hat Ansible Automation Platform provides Infrastructure as Code (IaC) capabilities to its reliability engineers for faster application testing in a production-like environment.

Since initial implementation, more than 2 million patients from 17 of the country’s 24 provinces have been registered in the national digital health network. Its work to use enterprise open source technology to improve national healthcare earned the Ministry of Health recognition as a winner of a 2020 Red Hat Innovation Award.

Connecting care providers for holistic healthcare insight

Established container-based integration for improved patient care

The Ministry of Health’s national digital health network has successfully united disparate data sources to help improve the patient experience. Using a central application programming interface (API), any healthcare center in the country can request and transfer information, verified by a patient cross-identification system.

With this new digital health network, Argentina can continue finding new ways to streamline the patient experience. For example, the country is implementing a national digital prescription standard to let doctors create prescriptions, check for interactions with prescriptions from other providers, and share them digitally with pharmacies to eliminate paperwork or coverage checks.

“It was a big cultural change to work with microservices, containers, and APIs, instead of monolithic end-user applications, but now each province and each private institution has complete autonomy over their local systems while still letting us define standards and maintain the central infrastructure,” said Lopez Osornio. “Patients who have to travel for treatment for chronic conditions are now going to be seen by doctors who have access to their complete health information. Providers in different cities will be able to collaborate to ensure the highest quality of care for patients.”

Improved efficiency with scalable, reliable platform and new work approaches

Scalability is key to the success of the new national digital health network. The Ministry of Health is expecting an increase of close to 1,200% in the number of clinical record transactions by the end of 2020, and its new microservices- and container-based infrastructure is up to the challenge of this rapid growth. Automation of routine provisioning tasks with OpenShift and Ansible Automation Platform has significantly accelerated scalability. Now, the Ministry of Health can meet both seasonal and ongoing demand changes.

"In the summer, we have many more records related to respiratory diseases or vaccine-related cases. In February and March, doctors register to take their residency exams," said Rodrigo Álvarez, DevOps Coordinator, Argentine Ministry of Health. "With microservices, we can monitor and analyze traffic to shift resources and accommodate demand during these peaks."

To fully benefit from improved flexibility, the Ministry of Health also needed a scalable work approach. Building on its past experience with agile approaches, the ministry's teams embraced DevOps and continuous integration and delivery (CI/CD) models to work at the pace of demand.

Now, the Ministry of Health can deliver service improvements and new features to the country's citizens much faster. "OpenShift accelerated a lot of our operations. Before, to deploy a test, we had to ask for a virtual machine via a ticket to our cloud providers. It was a really slow, static process," said Lopez Osornio. "Today, deploying a new container, platform, or application is much simpler and immensely faster."

Protected sensitive patient data with secured access and proactive updates

The national digital health network provides access to citizens' sensitive personal medical data, requiring the highest security measures to ensure only authorized health providers and other parties have access.

With enterprise open source technology, the Ministry of Health can take advantage of community-based development to ensure security flaws or weaknesses are identified more quickly than with traditional, closed-source development models.

"We need to offer the utmost assurance that people's medical information would travel safely, in a way that is encrypted, safe, and controlled," said Lopez Osornio. "Open source technology is subject to constant public scrutiny from community members, from individual developers to larger contributors like Red Hat."

Working closely with Red Hat consultants and a Technical Account Manager helps the Ministry of Health's teams continue to refine their technology strategy to ensure patient data is protected and systems are running efficiently. "When I think about Red Hat, I think about the capacity of their experts to help us understand, manage, and learn about open source and help developers feel comfortable using these types of tools effectively," said Lopez Osornio.

Expanding digital health network nationally

During the next year, the Ministry of Health aims to increase registration to more than 15 million patients, integrate care providers across all 24 provinces, and continue adding new services and features to its network. For example, the ministry is using OpenShift to develop Mi Argentina, a patient portal application for mobile devices that will provide vaccination records and other personal health information to citizens.

Its Red Hat-based infrastructure also provides the opportunity for future hybrid cloud adoption as regulations become more accommodating to private cloud technology.

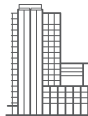
As part of its continued efforts to move towards digital-focused healthcare, the Ministry of Health is evaluating adding Red Hat 3scale API Management to its infrastructure. The ministry also plans to continue its Container Adoption Journey to achieve independent operation of cloud-native technologies.

“This mix of open source culture with technological quality has generated innovation and created a model for strategic enhancement of all information distribution systems in Argentina,” said Lopez Osornio. “With support from Red Hat, we have confidence that integrating all of the health data in Argentina is possible.”

About the Argentine Ministry of Health

The Ministry of Health is a public entity of Argentina, responsible for addressing administrative issues related to health service, including epidemiology, vaccination campaigns, border health control, registration of health professionals, drug bank, among others, guaranteeing the accessibility and the quality of medical attention to the entire society.

About Red Hat



Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers integrate new and existing IT applications, develop cloud-native applications, standardize on our industry-leading operating system, and automate, secure, and manage complex environments. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500. As a strategic partner to cloud providers, system integrators, application vendors, customers, and open source communities, Red Hat can help organizations prepare for the digital future.



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