Argentine Ministry of Health builds national digital data network with Red Hat

To improve patient experiences with universal healthcare, the Argentine Ministry of Health decided to build a national digital health network that would allow care centers to more securely access patient data through standardized integration among providers. To establish a flexible yet stable IT infrastructure based on microservices technology, the Ministry of Health adopted Red Hat container, integration, and automation solutions. Combined with modern development approaches like DevOps that support collaborative, efficient work, the new infrastructure offers the scale and agility to support sharing of medical data for millions of patients across 24 provinces.

Software

Red Hat® OpenShift®

Red Hat Fuse

Red Hat Data Grid

Red Hat Ansible® Automation Platform

Services

Red Hat Technical Account Management

Red Hat Consulting

Red Hat Training

Buenos Aires, Argentina

Headquarters

Healthcare

4,500 employees
45 million residents

Benefits

- Integrated medical data for more than 6 million patients across 24 provinces

- Gained responsive scalability to meet 1,500% increase in transaction volume

- Established protected, API-based data access, backed by community and Red Hat expertise

"*Working with Red Hat means more than just adopting software. They helped our teams develop their skills, as well as learn more about available tools and updates, to make better decisions independently.*"

Fernando Núñez
National Director of Health Information Systems,
Argentine Ministry of Health

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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 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. They are often 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—requiring them to bring hard copies of test results or medical history information to each facility.

To solve these challenges, the Ministry of Health decided to build a national digital health network. Using online scheduling systems and telemedicine following the latest health interoperability standards, care centers could more securely access data from different providers to get a holistic view of a patient's health history.

This network would let the Ministry of Health address complexity, data access, and IT performance challenges, but universal electronic health records require scalable, more secure technology. The ministry's existing databases were built on slow legacy solutions with monolithic applications that could not be upgraded. As a result, each development stage took weeks, even months, greatly delaying time
to market.

To automate the flow of public health statistics and management of underlying systems, the Ministry of Health sought to establish a flexible yet stable IT infrastructure.

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

The Ministry of Health focused its technology search on open source. "Open source code is advantageous for public entities, because it helps us take advantage of our budget and other resources more efficiently, including developing in-house skills," said Fernando Núñez, National Director of Health Information Systems, Argentine Ministry of Health.

It 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 government's main datacenter. Red Hat's enterprise open source technology met this need, backed by expert, hands-on support. Through the Red Hat Container Adoption Journey engagement, the ministry worked with Red Hat Consulting and a Red Hat Technical Account Manager to define the project and build its new architecture, as well as receive related training.

The core of the IT infrastructure supporting Argentina's national digital health system is Red Hat OpenShift running on premise on ARSAT servers. After initial deployment, the ministry updated from Red Hat OpenShift 3 to Red Hat OpenShift 4 to simplify application installation and improve resiliency for distributed applications with the service mesh component. Running on Red Hat OpenShift, Red Hat Fuse—part of Red Hat Integration—and Red Hat Data Grid connect healthcare providers' databases with the ministry's federated database system. Red Hat Ansible Automation Platform provides Infrastructure as Code (IaC) capabilities to its reliability engineers for faster application testing.

Since 2018, more than 6 million patients from 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 Red Hat Innovation Award in 2020 and 2021.

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 using container and microservices technology to help improve the patient experience.

With a central application programming interface (API), any healthcare center in the country can request and transfer information, verified by a patient cross-identification system. Providers in different cities can collaborate to ensure patients who travel for treatment for chronic conditions will be seen by doctors who have access to their complete health information. Each province and private institution retains autonomy over their local systems while the national government defines standards and maintains the central infrastructure.

This new digital health network helps Argentina continue 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.

Improved efficiency with scalable, reliable platform and new work approaches

Automation of routine provisioning tasks with Red Hat OpenShift and Ansible Automation Platform has significantly accelerated scalability of the new national digital health network. Building on its past experience with agile approaches, the ministry's teams also embraced DevOps and continuous integration and delivery (CI/CD) models to work at the pace of demand.

"In the summer, we have many more records related to respiratory diseases or vaccines. 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."

This approach helped the Ministry of Health respond quickly when the system for reporting diseases experienced a 1,500% increase in transaction volume—more than 10 million reports—in just the first month of the pandemic. Additionally, it used Red Hat OpenShift to create a central panel for tracking related data, provided by and shared with the national and provincial governments to inform critical public health decisions.

"With the increased demand in data queries, logging, and COVID-19 case reporting, Red Hat OpenShift helped us collect, manage, and analyze all of that information to provide real-time numbers," said Martín Díaz, Medical Interoperability Project Leader, National Directorate of Governance and Health Information Systems Integration, Argentine Ministry of Health.

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 identify security issues faster than with traditional development models.

Additionally, 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.

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Expanding digital health network nationally

During the next year, the Ministry of Health aims to increase registration to more than 15 million patients, use its COVID-19 panel to inform vaccination planning, and continue adding new services and features to its network. For example, the Mi Argentina patient portal will provide vaccination records and other personal health information to citizens.

As part of its continued efforts to move toward digital-focused healthcare, the Ministry of Health is evaluating adding Red Hat 3scale API Management—part of Red Hat Integration—to its infrastructure. The ministry also plans to continue its container adoption journey to achieve independent operation of cloud-native technologies.

"This year, our priority is to continue improving the interoperability of our regional medical systems with the Red Hat team," said Fernando Daniel Gassino, Solutions Architect, Argentine Ministry of Health.

About the Argentine Ministry of Health

The Argentine 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, and a drug bank, among others, to guarantee the accessibility and quality of medical attention to the entire society.

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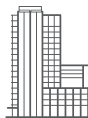
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