

BrianzAcque uses real-time data for smart water kiosk network with Red Hat OpenShift



BrianzAcque provides water and sewage utility services to close to 900,000 citizens in Italy. The utility provider operates 66 self-service Case dell'acqua water kiosks across the region. To centralize management of its smart kiosk network and provide real-time data on water quality to citizens, BrianzAcque sought to establish a microservices-based IT foundation. Using Red Hat OpenShift Container Platform and Red Hat Enterprise Linux, the utility provider can now manage each kiosk centrally, yet deliver locally tailored services and information. The success of its smart kiosk network has created opportunities to expand to new locations and partner with other municipal service providers.

Software and services

Red Hat® OpenShift®
Container Platform

Red Hat Enterprise Linux®

Partner

Plurimedia



Utilities

322 employees

Benefits

- Automated delivery of water quality to 40 public kiosks
- Reduced lab data publishing costs by 50% and management staff effort by 70%
- Established security to meet industry regulations for data and communications

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Enrico Pivari

Case dell'acqua Project Head, BrianzAcque



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Case dell'acqua Project Head,
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Creating an intelligent water distribution network

Founded in 2003 as a multi-business organization, BrianzAcque manages the water supply and sewage system for the Province of Monza and Brianza, Italy. Nearly 900,000 citizens rely on its services. BrianzAcque manages 111 million cubic meters of water each year, spanning 3,000 km of drinking water pipes.

As with many utility suppliers, much of BrianzAcque's work goes unnoticed by the public. But in 66 towns across the region, the company has a highly visible local presence through its self-service Case dell'acqua water kiosks. They dispense high-quality still and sparkling water, purchased using a rechargeable payment card. These smart kiosks not only serve as communal hubs for citizens, but also have created an opportunity for BrianzAcque to communicate directly with consumers through posted signs and digital displays.

To present relevant, real-time information to consumers at each Case dell'acqua location, BrianzAcque needed to integrate live data from its aqueducts and water purification plants—such as pH, calcium, chromium, nickel, mercury, and manganese levels—and create a central management system.

Additionally, kiosks must be able to read citizens' payment cards to identify users and process purchases.

The utility provider sought to create a more responsive intelligent IT architecture to support this network of real-time data and smart devices.

“We primarily wanted to ensure citizens had access to high-quality water, but the project has since evolved into a means to keep up to date with our services. We want to do more to communicate water quality,” said Enrico Pivari, head of the Case dell'acqua project at BrianzAcque. “We recognized a microservice architecture would provide the best approach. Each microservice can communicate with others yet deliver a consistent experience and user interface.”

Supporting smart water kiosks with Red Hat's enterprise open source solutions

To find a flexible, responsive technology foundation for its smart kiosk project, BrianzAcque worked with its partner Plurimedia to evaluate open source, multicloud-ready solutions. As a long-time customer, Plurimedia pointed BrianzAcque to Red Hat's enterprise open source technology.

“The technology in the kiosks is also open source, based on the Arduino interactive electronic platform,” said Maurizio Galotti, Head of Marketing and Sales at Plurimedia. “We also liked that Red Hat's container software can be distributed outside of the datacenter to adapt to IoT [Internet of Things] needs. It provides the best mix of stability and enterprise security.”

BrianzAcque now runs its Case dell'acqua water kiosks on Red Hat OpenShift Container Platform, using Red Hat Enterprise Linux as the underlying operating system and running on Amazon Web Services (AWS). Based on Kubernetes, OpenShift Container Platform provides a consistent platform for developing, deploying, and managing applications across multicloud infrastructure. With industry-standard container images, OpenShift provides portability across deployments and devices.

“We wanted a simple and flexible solution, but one that would also prove reliable and help us meet our security requirements. Red Hat OpenShift and Red Hat Enterprise Linux met our needs,” said Pivari.

Around 20 microservices have now been implemented using Red Hat technology, providing functions such as water quality reading uploads, form downloads and completion, and several components that support features on BrianzAcque's website.

Improving delivery of water and data, from source to tap

Achieved real-time delivery of water quality data

By creating a centralized data platform based on Red Hat OpenShift and AWS as the foundation of its microservices-based architecture, BrianzAcque can more effectively and accurately communicate water quality information to customers. Public service announcements, including opening times and local events or traffic conditions, can be transmitted via the kiosks.

"Our head office can monitor the quality of local water services on an ongoing basis and present any relevant information to the public with automatic data transmissions to monitors at 40 kiosks," said Pivari.

Additionally, the utility provider's internal teams can act quickly based on real-time data to make operational changes. For example, automatic alerts notify maintenance teams of repair or other service needs.

Improved operational efficiency and costs

Centralizing and standardizing its kiosk network with Red Hat OpenShift has also helped BrianzAcque simplify operational work for its internal teams—a key factor in the utility provider's choice to use Red Hat technology.

With consistency between the structure of different microservices, developers can focus on creating new features and fixes, rather than adapting to different infrastructures or environments.

"Internal business teams using one microservice can easily learn to use others. All of our microservices have all been designed with the same operating processes, logic, and interface," said Pivari.

With these changes, BrianzAcque has reduced staff time needed to manage and publish lab data by 70%, contributing to a 50% reduction in lab data publishing costs. The time and money saved can now be redirected to expanding kiosk functionality or constructing new kiosks when needed.

A microservices approach, supported by OpenShift, means services can be delivered with minimal human intervention, with resources available to scale as needed. Maintenance can be scheduled and completed with minimal disruption to customer-facing services.

Established robust security to meet industry regulations

As a provider of a public utility service, BrianzAcque must provide high reliability to both its internal teams and the users of its kiosks. In addition, the utility provider must comply with several industry and government regulations related to security and reliability. Water quality analysis must be completed and shared regularly with public health officials and other government bodies—securely and accurately.

"As with any utility provider, our operations are closely monitored by industry regulators and the media," said Pivari. "To protect our corporate reputation and ensure we can continue to operate, we must maintain a high level of water quality and service continuity.

"Previously, much of our reporting tasks and communication with third parties was done manually, creating risk of errors, and information shared both publicly and internally was often out of date."

BrianzAcque takes advantage of Red Hat's security-focused technology approach, working closely with the vendor to protect its data, network, and devices and proactively address threats or vulnerabilities across its OpenShift environment.

"We had to consider compatibility with our existing hardware and security approach," said Pivari. "Working with an experienced enterprise software provider like Red Hat helped us ensure compatibility and focus on security."

Expanding smart water kiosk network to new locations and use cases

BrianzAcque plans to extend its water kiosk network to more towns and villages in Italy, including placing smaller kiosks in new locations, such as fire stations, police stations, and government buildings, to provide new communications opportunities for other public service providers. BrianzAcque aims to have 100 kiosks operational by 2021, with plans to grow the network by an additional 40% each year.

"In the future, our Case dell'acqua water kiosks could be used by local authorities to provide relevant information, including multimedia communications, based on geography, such as weather alerts or police notices," said Pivari.

The utility provider is already planning new features for the next generation of its kiosk technology, including new self-service capabilities that will allow users to make payments or log machine or card payment issues.

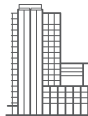
"By taking advantage of the flexible IT architecture we've built with Red Hat technology," said Pivari, "we are now well-positioned to create localized networks for monitoring, control, and maintenance of water utilities across the region."

About BrianzAcque

BrianzAcque manages the integrated water cycle in the Province of Monza and Brianza, Italy. It was founded in 2003 to bring together numerous businesses in the region, overcoming fragmentation by taking direct control. Today, the organization oversees the entire water supply chain: aqueducts, sewers, and purification. <http://www.brianzacque.it/>

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redhat.com
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North America
1 888 REDHAT1
www.redhat.com

**Europe, Middle East,
and Africa**
00800 7334 2835
europe@redhat.com

Asia Pacific
+65 6490 4200
apac@redhat.com

Latin America
+54 11 4329 7300
info-latam@redhat.com