Central Bank of Brazil builds instant payment network, Pix, with Red Hat technology

BANCO CENTRAL DO BRASIL

Brazil's economy, the largest in Latin America, is rapidly transitioning from cash-based to digital payments. To meet growing demand, the Central Bank of Brazil (BCB) created a new instant payment network, Pix. This innovative solution required a highly available, scalable IT infrastructure. With a new architecture based on Red Hat OpenShift, Red Hat Ansible Automation Platform, and technology from Red Hat Integration, BCB can cost-effectively support thousands of transactions per second while maintaining 24x7 service availability. This new service has also helped the bank promote competitive diversity in Brazil's financial services market.

Software

Red Hat® OpenShift®

Red Hat AMQ

Red Hat Ansible® Automation Platform

Services

Red Hat Technical Account Management

Red Hat Training

Red Hat Consulting

Brasilia, Brazil ●

Headquarters

Financial services, Government

3,600 employees

Benefits

- Cut transaction processing time from hours to seconds

- Built foundation for anticipated future savings in service costs—for users and internally

- Accelerated financial industry diversity and innovation

- Gained expert insight and guidance to enhance new IT capabilities

"Red Hat was an active, essential partner in this project. They allocated a large project team of experienced technicians that helped us become familiar with the technology and best practices."

Vicente Fernandes
Chief of Division of Server Architecture, Storage and Basic Software, Central Bank of Brazil

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Building a modern, innovative instant payment service

Brazil's economy—the largest in Latin America—is increasingly evolving from cash-based to digital payments, creating massive potential for financial services organizations.

The Central Bank of Brazil (BCB), a federal body linked to the Ministry of the Economy, is responsible for controlling inflation, issuing paper currency, and regulating the country's financial sector. Since 2002, it has led a program to modernize the Brazilian Payments System (SPB), which manages the transfer of financial resources between banks for payments between individuals, businesses, and the government.

In December 2018, BCB began work on Pix, a new instant payment network that uses ID keys or QR codes that are read by mobile devices. Using Pix, individuals or companies can make or receive payments in seconds, without needing debit or credit cards. The service is free for individual users. Additionally, this solution would help increase competition in Brazil's concentrated financial services market, where the top five lenders hold close to 80% of assets.

To create this innovative, modern solution, BCB needed an IT foundation that would support uninterrupted 24x7 financial services operation—without requiring extensive management effort.

"We wanted to create a solution that would offer flexible, secure financial transfers, improving our customer experience while reducing transaction costs and promoting financial diversity," said Vicente Fernandes, Chief of Division of Server Architecture, Storage and Basic Software, Central Bank of Brazil. "But to build Pix, we needed a simpler, more scalable IT infrastructure."

Creating a high-performance service infrastructure with Red Hat

BCB solicited vendor bids for technology to run Pix using a distributed, highly scalable architecture based on Apache Kafka, with Red Hat AMQ winning this selection process. AMQ streams, a component of Red Hat AMQ, offers distributed data streaming with high throughput and low latency for running, scaling, and managing applications in a cloud-native Kubernetes environment. Red Hat AMQ is part of Red Hat Integration, a group of products and components that support service and data transformation through improved connectivity.

"During the proofs of concept, Red Hat met all of our requirements while also offering the expert support and partnership that we needed to make sure we start off right with new technology," said Fernandes.

In addition to AMQ streams, BCB deployed Red Hat Ansible Automation Platform to create and implement reusable, easy-to-use infrastructure automation capabilities through its network. The bank uses Ansible Automation Platform to integrate Pix with third-party partners' automation solutions. Red Hat OpenShift, an enterprise Kubernetes platform, hosts the bank's access and business logic applications.

BCB worked closely with Red Hat Consulting to become familiar with and successfully deploy its new service infrastructure. "Red Hat was an active, essential partner in this project," said Fernandes. "They allocated a large project team of experienced technicians that helped us become familiar with the technology and best practices."

Pix successfully launched in November 2020, with more than 72 million registrations open to consumer and business users and an anticipated capacity of up to 200 million users.

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Supporting financial diversity and retailer growth

Reduced transaction processing time from hours to seconds

With its new high-performance technology architecture, BCB has dramatically reduced transaction processing times to ensure Pix meets user expectations for instant payments. Traditional payment methods, such as express wire transfers, paper payment forms, and credit cards, can take hours or days to process. During proof of concept testing with the anticipated volume of 2,000 transactions per second, BCB successfully processed 99% of its internal transactions within just four seconds using AMQ Streams and Ansible Automation Platform.

"People can pay friends and businesses instantly and access funds as soon as they are available," said Fernandes. "With Pix, money goes into their account instantly."

Anticipated improvements in service costs

Pix will help retailers reduce acceptance costs associated with consumers making credit or debit card payments and offer immediate, reliable access to funds from purchases. As a result, processing fees typically paid by or passed on to consumers will also decrease.

This shift to digital transactions from paper-based payments—which currently comprises 47% of financial transactions in Brazil, according to McKinsey—will also help BCB reduce operating costs.

"Other countries, such as Sweden and Denmark, are already reducing cash transactions. Brazil is very large, so providing banknotes and coins to every city for these transactions requires a major logistics effort," said Fernandes. "Over the longer term, we predict that encouraging this switch to digital payments will help us save significantly on transportation and logistics costs."

Accelerated financial industry diversity and innovation

The launch of Pix will help smaller, less established payment providers compete in the Brazilian financial market to offer valuable customer services, as well as help services like Uber become more accessible.

BCB's new infrastructure and architecture based on Red Hat technology will help the bank and its partners continue developing innovative digital services in a stable, high-performance cloud environment at the pace of demand.

"This new technology will allow us to collaborate in a way we could not before, to build a new, instant financial experience," said Fernandes.

Gained expert insight and guidance to enhance technology adoption

Working with Red Hat's technology experts before, during, and after deployment has helped BCB become familiar with new cloud and middleware technology and optimize its operation of AMQ streams, Ansible Automation Platform, and Red Hat OpenShift with proven best practices.

In addition to collaborating with Red Hat Consulting to successfully deploy the technology foundation for Pix, BCB engaged Red Hat Training to help its staff gain the skills needed to use and manage the new Red Hat software environment. The bank also engaged a Red Hat Technical Account Manager for ongoing support and monitoring to proactively identify potential issues and troubleshoot any challenges.

"The proposals Red Hat has provided have enhanced our new architecture with better availability," said Fernandes.

Expanding features to meet evolving user demand

BCB plans to continue working closely with Red Hat to enhance the availability, security, and performance of Pix, as well as add new features to continue improving its user experience. For example, expanding contactless payment and e-commerce transaction features are planned for the next year.

For its back-end systems, BCB plans to continue to optimize automation and orchestration using its Red Hat infrastructure capabilities.

"We're already seeing a return on the investment in the Pix platform," said Fernandes. "Going forward, we believe that Brazilian society as a whole will benefit from the innovative solution we've introduced."

About The Central Bank of Brazil

The Central Bank of Brazil (BCB) is a federal body linked to the Ministry of the Economy. Created in 1964, its mission is to assure the stability of the Brazilian currency's purchasing power and a solid and efficient financial system. www.bcb.gov.br/

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