Yokohama City

NEC helps Yokohama City to achieve stable and efficient Java-based batch processing of large-volume data on an open, standardized information sharing platform.

**Overview**

Determined to tackle the inefficiencies and escalating costs involved in developing and operating their business systems, Yokohama City decided to construct a standardized, open information sharing platform, and totally rebuild their health and social welfare system.

Tasked with rebuilding the health and social welfare system, NEC implemented WebOTX Batch Server, an NEC solution that could operate on an open framework and that resolved the problems inherent in executing large-volume batch processing based on Java.

With the new system, Yokohama City was able to execute batch processing of large amounts of data, including more than 300,000 monthly child benefit payments, stably and efficiently.

**Challenges**

Yokohama City is responsible for the welfare of 3.6 million residents and faces a range of problems unique to big cities. In processing large volumes of data, exception handling that would occur once or twice a year in other municipalities would occur daily. This meant that package applications could not be used, making it necessary to optimize business systems individually. The same functions therefore had to be developed over and over again and it was difficult to link data. The health and social welfare system in particular required frequent modification to keep pace with changes in the law, turning the system into a complex black box that could only be maintained by the initial vendor. This vendor lock-in was also a cause of rising costs. To solve these problems, Yokohama City joined forces with the National Institute of Advanced Industrial Science and Technology (AIST) to construct an information sharing platform compliant with the AIST Comprehensive Framework*, and at the same time decided to rebuild from scratch their health and social welfare system and welfare service for persons with disabilities.

**Customer**

- Yokohama City

**Industry**

- Local government/public service—Yokohama City, Kanagawa Prefecture, Japan

**Solution**

NEC implemented WebOTX Batch Server (part of NEC’s WebOTX application service platform software suite)

- The solution bundled open source software, Spring Batch Framework, eliminating vendor lock-in as requested by the client.
- Spring Batch Framework was included to enable batch processing to be executed stably within a fixed time.
- Java VMs were configured as tenants on WebOTX Batch Server and batch processing was executed in parallel by means of multithreading, enabling the implementation of semi-realtime processing in which processing is performed once every 30 seconds.

**Results**

- Vendor lock-in was eliminated by employing open, standard technologies.
- Batch processing of more than 300,000 jobs could be executed quickly, stably, and within a fixed time.
- Semi-realtime processing capability enabled faster and more stable job execution, leading to improved citizen services and more efficient counter operations.

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* This is a framework developed by the National Institute of Advanced Industrial Science and Technology (AIST) and defines standard vendor-independent software development methodologies, common software, and development rules.
Solution

Executing large-volume batch processing was the biggest challenge for the new health and social welfare system which was to run on the information sharing platform. The AIST Comprehensive Framework was designed for Java, but did not provide specifications for batch processing. Also, in a Java-based system, the virtual machines (VMs) take a long time to start up, so continuous batch processing can consume a lot of system resources, degrading the operating performance. NEC’s answer to these problems was WebOTX Batch Server, a solution that utilizes Spring Batch Framework open source software.

Takao Midorikawa, in charge of information sharing systems in the Information Systems Division of the IT Application Promotion Department in the General Affairs Bureau explains some of the problems they faced:

“We are responsible for processing more than 300,000 monthly payments just for child benefits, and we also have other batch processing that must be executed daily. It was essential that batch processing could be executed stably and within a fixed amount of time.”

Upon confirming the compatibility of the Spring Batch-based WebOTX Batch Server with the AIST Comprehensive Framework, Yokohama City decided to adopt NEC’s solution.

The new health and social welfare system used WebOTX Batch Server to batch process a wide range of data including benefits for children, the elderly, and residents with disabilities. With WebOTX Batch Server, Java VMs reside on the server and batch processing is performed in parallel by means of multithreading. This reduces the amount of memory consumed and achieves operational stability.

WebOTX Batch Server also features semi-realtime processing capability by which data recorded in the resident registration system configured on the host is batch-processed once every 30 seconds and then moved to the health and social welfare system. WebOTX Batch Server is also backed up by a report management server with almost identical functionality, enabling improved availability in the event of failure because a primary-secondary system is configured that enables functional complementation.

Results

WebOTX Batch Server accelerated batch processing and improved operational stability, allowing the client to allocate more time for online work.

“Having semi-realtime processing capability means that people moving into Yokohama City can file their paperwork at the Health and Welfare Division counter and have everything processed on the same day,” said Midorikawa. “And in addition to improved citizen services and more efficient counter operations, we have also realized better server availability.”

After almost a full year of operation, the system continues to function smoothly and stably.

Norihisa Toyota, assistant manager in the Information Systems Division of the IT Application Promotion Department in the General Affairs Bureau, praises NEC’s proposal:

“When building this system, NEC didn’t just take a technical approach; they also considered the type of work carried out by Yokohama City and worked together with us to resolve problems. They really did propose an ideal solution.”

With the new, open information sharing platform, Yokohama City was able to eliminate vendor lock-in when rebuilding their health and social welfare system and move one step closer to total optimization. Eliminating vendor lock-in also made the procurement process fairer and more competitive, leading to reductions in development and operating costs.

Midorikawa anticipates that NEC’s solution will also have an important role to play in the future.

“The needs of Yokohama City residents are becoming more diverse, and when the Personal Identification Number Act becomes law, we are going to need separate resident system that links personal identification numbers with the information held by local governments. Data will need to be able to be linked freely and organically between business systems. We think that the batch and parallel processing capabilities of WebOTX Batch Server will provide the solution we need.”