Tokyo Electron Ltd. connects SAP S/4HANA and core systems using Red Hat Integration

TEL
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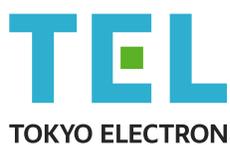
Software and services

Red Hat® Integration

Red Hat OpenShift®

Red Hat Consulting

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Fujitsu Limited

Tokyo Electron Ltd. (TEL) is Japan's global supplier of semiconductor manufacturing equipment. To connect its core SAP S/4HANA® environment with a variety of department-specific subsystems and data, TEL sought to transform the interfaces from this mix of legacy and modern tools into microservices. With a new foundation based on Red Hat OpenShift and Red Hat Integration, the manufacturer has improved developer productivity and achieved 100% system availability—with minimal additional system load. Now, its businesses around the world can operate and make business decisions more efficiently.

Tokyo, Japan ●

Headquarters

Manufacturing

14,668 employees
(consolidated)
17 countries and regions

Benefits

▶ Improved developer productivity with microservices and container technology

▶ Achieved 100% system availability with minimal additional system load

▶ Simplified adoption of new integration approach with expert guidance

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Yoshiyuki Kaki
Deputy Division Manager,
Information Systems Department,
IT Division, Tokyo Electron Ltd.

Bridging specialized systems with core SAP infrastructure

Tokyo Electron Ltd. (TEL) is Japan's only domestic producer of a full line of semiconductor manufacturing equipment. Previously, each of its departments, factories, and local foreign subsidiaries maintained and optimized separate business systems and processes to take advantage of their unique strengths.

In April 2021, a new revenue recognition standard, IFRS 15, introduced new definitions for how sales are recognized and reflected in financial statements. TEL sought to unify the wide variety of in-house information across the company to respond to this change while simplifying management and improving.

It adopted SAP S/4HANA to build a new, core enterprise resource planning (ERP) system. However, even though this ERP system consolidated data and management tasks, business units and factories required independent subsystems.

"If we abruptly changed our sales, accounting, inventory, and production systems, which are in operation every day, it would create turmoil," said Yoshiyuki Kaki, Deputy Division Manager, Information Systems Department, IT Division, TEL. "Instead, we wanted to use the stable individual systems but find a way to centralize management between close to 80 subsystems and our SAP environment."

To achieve overall unification with minimal disruption, TEL sought an application programming interface (API) management tool to transform interfaces from a mix of legacy and modern subsystems into microservices.

"The objective of our business transformation project is to accelerate business and management decisions and, as a result, improve our competitiveness and customer satisfaction," said Mr. Kaki.

Building a microservices-based approach with enterprise open source solutions

After researching potential solutions — including RESTful API and costly extract, transform load (ETL) tools, TEL adopted Red Hat Integration to connect its independent systems to its SAP environment.

"Many of the functions of our various subsystems had been created with legacy technology, and we also needed to translate data to meet SAP's specifications," said Mr. Kaki. "The only solution that could fulfill these requirements was Red Hat Integration, with its wide range of protocol conversion options. We also liked the involvement from the open source community to speed product improvement."

Red Hat Integration is a set of flexible enterprise technologies that provide API connectivity, visibility, and management to integrate existing and new applications, data, processes, and more through more than 200 connectors. It includes Red Hat Runtimes for microservices-based architectures, Red Hat Fuse for distributed integration, Red Hat 3scale API Management for API monitoring, and Red Hat AMQ for messaging and data streaming.

TEL conducted a 2-month proof of concept (POC) to check performance and troubleshoot possible issues before working with local partner Fujitsu Limited to deploy Red Hat Integration in Red Hat OpenShift. This enterprise Kubernetes container platform, optimized to improve developer productivity and support innovation, was deployed as a managed service maintained by Fujitsu. Red Hat Consulting and Red Hat Support provide ongoing, expert guidance to maintain performance and resolve any potential issues.

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The first phase of TEL's new core system, deployment at the company's headquarters, went live on schedule in May 2021.

"The core system could only go live at the company-wide level during a lengthy holiday period, and just one postponement would have been a huge loss," said Mr. Kaki. "Thanks to Red Hat's attentive support, we were able to resolve potential obstacles and release the core system on schedule. They really were the saviors of the project."

Bringing stability and efficiency to production operations

Improved developer productivity with container-based architecture

TEL's monolithic legacy architecture created dependency challenges with varying versions of different components, such as middleware technology.

By adopting a container-based architecture with Red Hat OpenShift, including shifting systems architectures to more modular microservices, TEL has improved deployment times to both development and production environments. The company's teams can now more easily optimize each API independently, rather than having to change a variety of minor settings. This new technology approach is enhanced by a continuous integration and continuous delivery (CI/CD) pipeline.

Achieved 100% system availability

With its new system environment connected by Red Hat Integration technology, TEL has surpassed its 99.5% availability goal and achieved 100% availability in live operations.

One key tool in eliminating downtime was the Red Hat Universal Base Image (UBI), part of Red Hat OpenShift. By building its container-based microservices environment with this set of verified, curated images from Red Hat, TEL has avoided time-consuming, disruptive maintenance and updates as a result of vulnerabilities or other issues.

This stability was achieved with just a 10% increase in system load. "In performance testing of Red Hat Integration before going live, even adding load under fairly severe conditions, the system load didn't go over 10-20%. We felt confident that any process we needed could be executed with ease," said Manabu Fujiwara, Information Systems Department, IT Division, TEL.

Simplified adoption of new integration approach with expert guidance

To optimize integration between its core SAP environment and many subsystems, TEL engaged Red Hat Consulting and Red Hat Support. Red Hat's technology experts worked closely with TEL's staff during the year-long build process. For example, they helped TEL connect more than 70 different account settlement programs—some used on mainframes for several decades and others built for Microsoft Excel.

"From when the requirements were set, Red Hat Consulting offered to start coding in just 3 days and we had a program nearly finished in 3 weeks," said Yuta Sugawara, Information Systems Department, IT Division, TEL. "They have incredibly advanced architecture design capabilities."

To help its teams enhance their skills, TEL also engaged Red Hat Training through Red Hat Learning Subscription, an all-access pass to online learning courses, video classroom courses, course materials, lab time, and field-expert lessons.

Continuing business transformation with a trusted vendor

TEL plans to gradually extend its new integration approach to its factories in Japan and subsidiaries worldwide by 2023.

"In support of our ongoing business transformation work, we need the innovation of open source, easily accessible through continuing to work with Red Hat," said Mr. Kaki. "We plan to continue to work with Red Hat's experts to provide guidance as we progress."

About Tokyo Electron Ltd. (TEL)

Tokyo Electron Ltd. (TEL) is an equipment manufacturer that makes "equipment to make semiconductors." Semiconductors mounted in electronic equipment play roles analogous to brains in humans. Semiconductors are commonly used in a variety of electronic devices, from everyday objects to those in outer space. With the arrival of the IoT era, where AI, big data, autonomous driving, and all sorts of devices link up to the internet, there will be a need for semiconductors with even higher performance and in greater numbers than ever before. To achieve this, it's essential for an equipment manufacturer to have technological innovation. As Japan's top semiconductor manufacturing equipment manufacturer, TEL is supporting the world's electronics industry and taking up the challenge of leading-edge technology and development each day.

About Red Hat Innovators in the Open

Innovation is the core of open source. Red Hat customers use open source technologies to change not only their own organizations, but also entire industries and markets. Red Hat Innovators in the Open proudly showcases how our customers use enterprise open source solutions to solve their toughest business challenges. Want to share your story? Learn more.

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 develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. A trusted adviser to the Fortune 500, Red Hat provides award-winning support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

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