

Case study

The City of Yawata

Facing challenges with physical server sprawl as its e-government implementations advanced; the City of Yawata used Microsoft Hyper-V virtualization and Fujitsu hardware products, to consolidate its infrastructure and reduced server numbers by two-thirds, with consequent savings in space, power, and hardware maintenance costs.

The customer



Name: The City of Yawata
 Country: Japan
 Industry: Local government
 Address (the City Hall of Yawata): Yawata-Sonouchi 75, Yawata City, Kyoto Prefecture, JAPAN
 Population: 74,186 (as of September 2011)
 Number of households: 31,183 (as of September 2011)
 Yawata City official website: <http://www.city.yawata.kyoto.jp/>

The challenge

- Need to address space constraints that were an obstacle to speeding up Yawata's e-government efforts.
- IT energy consumption reductions to improve the City's environmental sustainability performance.
- Time reductions in recovering servers from hardware failures.

The benefit

- Server virtualization and consolidation reduced the number of physical servers from 12 to four. This allowed all the City's systems to be housed in a compact single rack.
- The compact centralized deployment also reduced hardware maintenance costs by two-thirds.
- The greater performance per watt of the Fujitsu server hardware delivered more performance than conventional hardware products. Coupled with the smaller footprint, this provided significant overall IT power savings, with the optimized IT resources, further reducing energy requirements.
- System availability and business continuity were also greatly improved by the Hyper-V Live Migration feature. Even if a physical host fails, affected virtualized workloads can be restarted on another healthy server; minimizing time required for service recovery.

Overview

The City of Yawata in Kyoto, Japan is known for its rich history and beautiful natural surroundings. The City is also very active in developing its computerized and networked city government. On replacing Yawata's regional intranet system, that supported day-to-day administrative operations of the city government, it implemented a server virtualization and consolidation solution, using Microsoft Hyper-V virtualization on Fujitsu PRIMERGY servers. As a result, the city was successful in reducing the number of physical servers by two-thirds, as well as saving on associated server space, hardware administration costs, and energy consumption. The IT resource optimization from virtual consolidation, combined with the greatly improved server performance-per-watt of the new hardware, allowed Yawata to achieve extensive energy cost savings, and boosted the City's environmental sustainability efforts. The newly deployed Hyper-V-based virtualization environment, helped by the Live Migration feature, also delivered vast improvements in system availability and business continuity for this growing city.

Customer background

The City of Yawata had growing concerns with its regional intranet system that was the core infrastructure supporting its day-to-day administrative operations.

Situated in the City of Yawata, and straight out of a Japanese historical drama, the Nagare-Bashi bridge, one of the longest wooden bridges in Japan, is popular for the filming of Edo period movies. In particular, for scenes showing long processions of people crossing the river. Yawata is also well-known for its rich history, heritage architecture and beautiful natural surroundings. The signatures of the city include the Iwashimizu Hachiman-gu shrine, built by order of Shogun Tokugawa Iemitsu (the third shogun of the Tokugawa dynasty), Mt. Otokoyama, noted for its very different yet equally beautiful four seasonal views, idyllic scenery that stretches around the unique city area where the three rivers (Kizu-gawa, Ujigawa, and Katsuragawa) join, and Shokado bento – a traditional Japanese meal served in a beautiful, black-lacquered, box - that provides an authentic taste of Kyoto.

Located as it is between the two big and modern cities of Kyoto and Osaka, Yawata has become an ideal residential area to live in. In 2002, the city declared itself "a local government for sustainability" with the aim of becoming an environmentally-friendly community where people and nature can coexist.

Products and services (Hardware)

- Fujitsu PRIMERGY RX300 S6 servers
- Fujitsu ETERNUS DX60 disk storage

Committed to preserving its fascinating local history and beautiful nature, and improving the lives of its citizens, the city first introduced its regional intranet infrastructure (Yawata Intranet) in 2002 to support day to day operation of the city. Since then, the Yawata Intranet, including groupware and email systems, has functioned as a core IT service that members of the public can rely on, on a daily basis.

"We implemented the Yawata Intranet in 2002, but by 2010 the aging intranet infrastructures were approaching their replacement time. At that time, we were also facing a wide variety of other issues and challenges," recalls Mr. Shinya Iwasaki, Manager, IT Promotion Group, IT Promotion Division, Administration Department, the City of Yawata. As a result of the City's continuing efforts to develop a more advanced digital community, the number of physical servers had kept increasing, with associated increases in server power consumption. This was a headache as the city had a strong commitment to eco friendliness. In addition, the aging system raised growing concerns regarding operational stability and business continuity, according to Iwasaki.



Mr. Shinya Iwasaki
Manager, IT Promotion Group
IT Promotion Division
Administration Department
The City of Yawata

Microsoft Hyper-V-based virtualization adopted for Yawata Intranet reconstruction

The City of Yawata turned to Microsoft Hyper-V to achieve higher levels of system stability and availability, while reducing floor space requirements.

Of the IT challenges the City was facing, Yawata Intranet stability was the biggest concern, and the City wanted to put priority on addressing this issue. "Previously, in order to reduce hardware expenses, we had run multiple applications on a single physical server. For example, our groupware and Domain Controller resided on the same machine. This approach had sometimes caused service availability issues, because if one application needed to change, it would affect all the neighboring applications. Also, such multi-resident environments where the impact of a single hardware failure could affect large areas of the system became a growing concern for us all," notes Iwasaki. "To achieve our primary goal of making the Yawata Intranet more secure and stable, we wanted to have an individual dedicated machine for each application," Iwasaki continues. But space-constraints in the server room didn't allow that. "All our servers - including mission-critical servers, data warehousing servers and e-education servers were packed into one server room. We had just refurbished our mission-critical system, which resulted in a heterogeneous mixture of new and old machines. Our server room was almost full, and there was now insufficient space to support further capacity growth for the Yawata Intranet," says Mr. Kenji Konishi, Assistant Director, IT Promotion Division, Administration Department, the City of Yawata.

To solve the situation, the City began considering adoption of virtualization technology with the expectation of deploying virtual

Products and services (Software)

- Microsoft Windows Server 2008 R2 Hyper-V
- Microsoft System Center Virtual Machine Manager 2008 R2

machines, each dedicated solely to one application. The city also thought, a virtualized and consolidated environment, would enable it to address future growing server resources needs, without having to add additional physical boxes. Importantly, server virtualization also seemed to be an efficient way to improve system availability and reduce energy consumption. After thorough consideration of various virtualization products, Yawata City decided to implement Microsoft Hyper-V. Iwasaki says that the Hyper-V-based virtualization was a compelling option for the city.

"Considering the fact that Hyper-V is an integral part of Microsoft Windows Server 2008 R2, we thought Hyper-V would be the most cost-efficient solution. Thankfully, most of our existing assets, used for the Yawata Intranet, were based on Windows and we didn't see any issue in terms of Hyper-V support in the planned new environment. We also liked the idea a Hyper-V implementation with the Live Migration feature would enable us to achieve higher levels of system availability without investing a lot of money for HA deployment. Another factor that gave us confidence was the fact that Hyper-V was becoming more and more widespread. We had heard quite a number of success stories." As a result, the City decided to move ahead with its Hyper-V virtualization adoption, with confidence.



Mr. Kenji Konishi
Assistant Director
IT Promotion Division
Administration Department
The City of Yawata

The process to success

The Fujitsu FSAS Inc. project team provided end-to-end support to keep Yawata City's first virtualization project moving forward.

In October 2010, the City of Yawata issued a Request for Proposal (RFP) and placed an open competitive bid to reconstruct the Yawata Intranet system and the city council's meetings broadcasting/meeting minutes search systems. As the City had already decided to go with Hyper-V, Yawata now stated in its RFP that on top of typical requirements such as technical capabilities and provision of high-quality, cost-efficient solutions, the city was looking for IT vendors who were currently Microsoft Gold-Certified Partners, with expertise and experience in Hyper-V implementations.

The result of this competitive bidding process was a contract awarded to Fujitsu FSAS Inc. (Fujitsu FSAS). "As it was our first time to adopt a virtualization solution, concerns remained as to practical operation and management of the new virtualized environment," recalls Mr. Kazuhisa Yasuda, Chief, IT Promotion Group, IT Promotion Division, Administration Department, the City of Yawata. That was where Fujitsu FSAS came through. Shortly after the project began, the City discovered that all of its concerns would be able to be addressed by working closely with Fujitsu FSAS. "To ensure the successful transition, Fujitsu FSAS created and provided us with sets of very detailed and well-written documents, including design specifications and procedures documents. They really helped us gain deeper insight into the new technology and build knowledge and know-how on an OJT



Mr. Kazuhisa Yasuda
Chief, IT Promotion Group
IT Promotion Division
Administration Department
The City of Yawata

(On-the Job Training) basis. We could continue to leverage all the provided documentation to make our day-to-day system operations more secure and efficient, during the actual operation phases," Yasuda continues.

Konishi also well recognized Fujitsu FSAS' flawless project execution capabilities.

"From problem management to coordination with Microsoft, Fujitsu FSAS initiated and carried out the project promptly, professionally and precisely, to keep things on-track.

Thanks to their broad support, we were able to complete the project as scheduled."

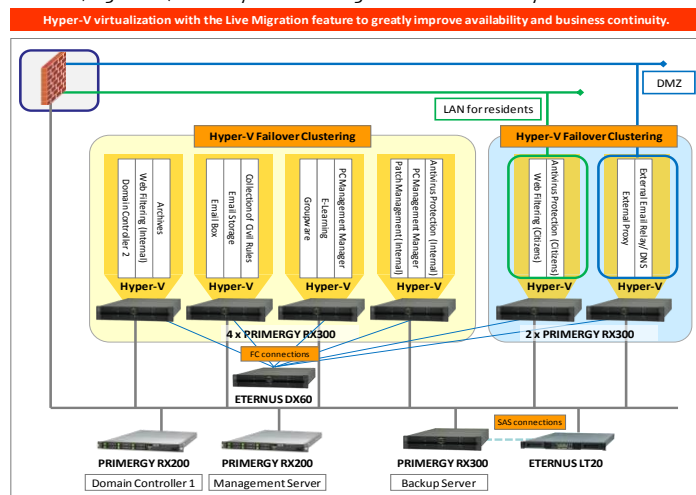
Fujitsu FSAS provided a step-by-step path to gradual migration to the new environment to minimize possible risks. The refurbished Yawata Intranet went live in February 2011. The new intranet system is comprised of Fujitsu PRIMERGY RX300 S6 servers and Fujitsu ETERNUS DX60 disk storage that provide enterprise-ready stability and robustness for use in virtualized environments. Microsoft Hyper-V was then implemented on top of the proven hardware infrastructure. For the host operating systems, the City selected Microsoft's Windows Server 2008 R2 Enterprise edition. Currently, four physical hosts are operating, each of which runs three virtual machines with the Hyper-V Live Migration feature. To ensure Yawata City's VMs stay online, the new system design incorporates automation capabilities - Even if one physical server fails, the virtual workloads running on the faulty host can be automatically distributed to and restarted on another healthy server. This dramatically improves system availability, while by fully utilizing the operating system-integrated free licenses for virtual instances, helps Yawata minimize costs. "For operational purposes, at Yawata, we regularly reboot our physical servers every Saturday. With the new configuration, we can seamlessly move running virtual machines from one physical host to another without causing any service disruption, prior to the reboot process. This greatly helps us increase productivity and minimizes the impact on users," says Konishi.

Business benefits and future scenarios

The new virtualization environment enabled Yawata City to reduce the number of physical servers by two-thirds, with beneficial floor space and server power consumption reductions.

Since deploying the new virtualization solution, the City of Yawata has seen vast improvements in its regional intranet system and the delivery of targeted benefits. The most dramatic change was the number of physical servers required. "Compared to the old intranet system, we were able to reduce our physical servers from 12 to four. Previously, we needed three rack cabinets to house our servers, but now, only a single rack is required to deploy all our systems. Fewer

(Figure 1) New system configuration at the City of Yawata



physical servers mean, we can slash the physical server maintenance overhead to one-third as well", says satisfied Yasuda.

Considerable reductions in server energy consumption are another area where the city is seeing dynamic improvements. Thanks to the newly employed Fujitsu PRIMERGY servers, with their much greater server performance per watt than the previous hardware, overall system power consumption has significantly reduced. Also, the optimized use of resources, achieved through virtualization and consolidation, is enabling further savings in power usage - helping the city reduce its environmental footprint. The new environment, constructed with Microsoft System Center Virtual Machine Manager combined with System Center Operations Manager, provides complete visibility and allows unified management of the virtualized infrastructure.

"Ensuring secure and stable system operations will continue to be our first priority. As it is a new concept for Yawata to manage and administer a virtualized environment, we seek continuous and detailed support from Fujitsu FSAS. At Yawata, we will soon need to focus on improving and upgrading our DR strategies, which are another significantly important area for us all. Especially after the entire nation was shaken by the impact of the 2011 Tohoku earthquake and tsunami. We'll soon need to start rethinking our disaster management, which will include facility reviews and site location reconsiderations to protect our systems against flood waters," says Iwasaki with forward-looking vision.

The City of Yawata is striving to serve its citizens with better services to uphold 'A vibrant, sustainable and peaceful living environment, with a perfect blend of nature, history and culture' as befits the image of the City. As a trusted IT partner of this growing city, Fujitsu is fully committed to providing end-to-end support with its industry-leading technological capabilities and facilitation of the City's e-government effort to help bring greater prosperity to Yawata City.

In collaboration with

Contact
FUJITSU Limited
Address: 1-5-2 Higashi-Shimbashi,
Minato-ku, Tokyo 105-7123 JAPAN
Website: www.fujitsu.com
2011-07-12-JP-EN

© Copyright 2011 Fujitsu Limited, Fujitsu, the Fujitsu logo are trademarks or registered trademarks of Fujitsu Limited in Japan and other countries. Other company, product and service names may be trademarks or registered trademarks of their respective owners. Technical data subject to modification and delivery subject to availability. Any liability that the data and illustrations are complete, actual or correct is excluded. Designations may be trademarks and/or copyrights of the respective manufacturer, the use of which by third parties for their own purposes may infringe the rights of such owner.