A significant reduction in the implementation period of a service development environment using a private cloud

HP Converged Infrastructure and private cloud built on HP ProLiant BL465c G7 Server Blades and open-source software (OSS) with Red Hat Enterprise Virtualization (RHEV) enables speed and supports business growth

GMO MEDIA

"In the increasingly commercialized world of social games, you can see quickly and clearly which games are becoming hits. Games are developed one after the other, and if they are not popular, they get quickly removed, but if they are, expansion is needed for the growing user base and the sense of speed becomes a priority. As deployment based on physical servers would have taken a month, with virtualization we thought that this could be greatly reduced, to several hours. Therefore, we designed a new IT infrastructure, based on a private cloud."

—Dai Utsui, manager of the Platform Engineering Department, GMO Media

Objective
- Reduce server deployment time
- Consolidate physical servers to virtualized servers
- Reduce operational costs

Approach
- To cut development costs, RHEV (an OSS virtual environment) was selected
- Using HP ProLiant BL465c G7 Server Blades with proven implementation records
- Using HP Virtual Connect to consolidate cabling in the virtualized environment
- To delegate responsibilities, HP hardware was deployed in bulk

IT improvements
- Physical servers reduced by almost 50 percent. Due to virtualization, the number of physical servers was greatly reduced from 900 units to 400
- Power costs reduced by 30 percent
- Deployment time decreased drastically, from about one month to a few hours

Business benefits
- Ability to introduce and withdraw services in a timely manner
- Minimizing the risk of service downtime

GMO Internet Group has developed a wide range of businesses in the world of the Internet. As part of these activities, GMO Media has developed services such as Net-based bulletin boards and blogs under the brand names *yaplog!* and *teacup*, and the company matured from this business.

Currently, the company is evolving into two main areas of business. One is the Internet media division, which performs the operation of the various information sites and community services such as blogs and social networking services (SNS); the other is the digital content division, which provides originally produced and collected content, such as ringtones or wallpaper images. Aiming at further growth in the future, the Internet media division is focusing on social media games. Besides developing original games, it is offering a platform for game developers to publish and sell their games. As of March 26, 2012, 21 social game titles have been published on this platform, and have started to gain a great deal of attention. On the other hand, in the digital content division, there is no intent to develop new types of services for smartphones. Within their core business, i.e. Android content, they have released various kinds of popular content, such as live wallpapers or official websites for entertainers.

In 2010, a project was started, aiming to speed up service development further by building the IT infrastructure on a private cloud. Eventually, they standardized on HP BladeSystem enclosures and HP ProLiant BL465c G7 Server Blades, together with Red Hat Enterprise Virtualization (RHEV), an open source virtualization platform that supports enterprise-level systems.

Building the IT infrastructure in a private cloud to maximize speed

"In Internet businesses, speed has bigger priority than anything else. Therefore we made efforts in our company to conduct not only the obvious systems development, but also operations in-house, using our own engineers. To maximize speed, we decided that it is essential to keep decision-making fully in-house, without being affected by external factors," says Dai Utsui, manager of the Platform Engineering Department.

Another pillar of the IT strategy was to maximize the use of open-source software (OSS). Except for the banking system, which is not directly related to service delivery, almost all systems are built on OSS. "This also aims at maximizing speed. OSS is developed by engineers around the world, so its development and enhancements are advancing at an extremely fast pace. This, together with keeping usage costs down, was a major factor," Utsui says.

However, as more and more services were offered, the number of physical servers kept increasing. To control this, the company quickly started consolidating the physical servers using virtualization. Using OSS virtualization software such as KVM and Xen, only small-scale server consolidation could be achieved. The initiative helped restrain the number of servers, but as the various kinds of virtualized environments proliferated, it did not lead directly to the reduction of operating costs.

According to Utsui, an even bigger problem was the deployment time it took to prepare the environment for the introduction of new services. "In the ever increasing commercialized world of social games, you can see quickly and clearly which games are becoming hits. Games are developed one after the other, and if they are not popular, they get quickly removed, but if they are, expansion is needed for the growing user base, and speed becomes a priority. As deployment based on physical servers would have taken a month, with virtualization we thought that this could be greatly reduced to several hours," Utsui continues.

This resolution required a change in thinking. Therefore, the company made a decision to implement virtualization on a large scale and set out to construct a new private cloud that would serve as the basis of the service infrastructure. We expected that not only the number of physical servers could be significantly reduced, but that the unification of the operation environment would result in the reduction of the costs and the workload of operation as well, in essence "killing three birds with one stone."

Selecting RHEV as virtualization software for performance and functionality

"The OSS virtualization platform RHEV became the No. 1 candidate for virtualization software. It was still the time before the official release of RHEV2.2, but with the cooperation of Red Hat we tested the beta version and confirmed if there were any problems in terms of performance or functionality," Utsui says.

The decisive factor in determining the adoption was the software costs. "VMware had been considered as another option, but while its licensing system is tied to the physical memory and the number of cores per processor, RHEV uses a per-socket subscription system. When making a comparison with the expected configuration, we found that RHEV reduces the costs tremendously," Utsui adds.

"Regarding management functionality, it is clear that VMware is more extensive. However, we were constructing a service infrastructure for internal use and we did not intend to open it for the public. The necessary functions for operations and management were live migration, snapshots and cloning. As RHEV has all these features, we decided it was right for us," Utsui continues.

At the time of RHEV2.2, some Windows-related operations were still necessary. However, considering that RHEV3.0 was expected to be a completely open-source solution, GMO Media supported the decision for adoption. "Using OSS, we could make it as cheap as possible, we could build freely on our own, and the management functionality we wanted was in place. Considering all these factors, we made a conscious decision to choose RHEV," Utsui says.

A change in policy: from rack-mount to blades, using HP ProLiant BL465c G7

Regarding the servers that would become the basis for the private cloud, a big policy change was made in the middle of the project. "Initially, we decided to use rack-mount servers. However, as we proceeded with the consolidation, we saw many limits—such as the problem of network cabling, for example. The more we consolidated, the number of cables grew and the management became troublesome. We consumed too many expensive 10 Gb ports on network switches. And, there was the issue with the low consolidation density. So, we decided to deploy blade servers," Utsui explains.

Due to existing server blades in the environment, GMO Media continued to deploy HP ProLiant BL465c G7 to support the virtualization efforts "We have been operating it in an HP BladeSystem c3000 Enclosure for about two years, and there were no major problems during that period, and we came to appreciate it as a highly reliable product. We also experienced its excellent manageability. In addition to the browser-based management functions, it works smoothly together with our HP Systems Insight Manager (SIM) and we could operate it easily even in complex configurations. The enclosures supported 100V, which also fit well in our environment," Utsui says.

The HP Virtual Connect Flex-10 10Gb Ethernet Module was included as a network virtualization technology in the HP BladeSystem. With this technology, a 10Gb physical port can be split up to four separate virtual ports. It is a powerful technology, offering network consolidation—which tends to be a challenge when consolidating servers through virtualization—and simple management. It can contribute to a significant reduction in network cabling. "The existence of this technology was one of the reasons why we selected HP-manufactured blades," says Utsui.

Together with the deployment to the HP BladeSystem c3000 Enclosure and the HP ProLiant BL465c G7, GMO Media conducted a full-scale review of the key component of private clouds, such as storage and network switches. The company chose the HP LeftHand P4500 G2 SAN for shared storage and the HP 5820 Switch Series as network switches.

"We standardized on HP Converged Infrastructure technologies to avoid distributing responsibilities. If we built a combination of hardware from different vendors, support in the event of a failure would become cumbersome and it would take longer to identify the cause of the problem. We expected that by standardizing we could get faster responses to failures and we could minimize the risk of service downtime. Choosing HP, a vendor that could supply all the necessary hardware was the right decision," Utsui concluded.

The number of physical servers reduced to less than half; power costs reduced by 30 percent

The decision to use HP hardware, beginning with the HP ProLiant BL465c G7 Server Blades, was made in April 2011. The equipment was purchased in June and the construction of a private cloud kept going at top speed. After only one month some systems already started operating on virtual servers in the new infrastructure.

"Before the project, we were overflowed by as many as 900 physical servers, and about a hundred virtual servers were in operation as well. With the new infrastructure, we settled at about 400 physical servers and a little over 400 virtual servers.

"We managed to achieve our initial goal—halving the number of physical servers—without any problems."
Dai Utsui, manager of the Platform Engineering Department, GMO Media

The ripple effect from reducing the number of physical servers is great. Removing the racks to accommodate the physical servers led to a decrease in facility costs. Power costs were reduced by 30 percent as well. Furthermore, in RHEV, power can be switched on and off at the virtual server level. After the March 31, 2011 earthquake, power conservation measures were requested, so fortunately we could manage the operation of the virtual servers carefully with this feature. To comply with the power reduction request, we managed to achieve an even greater decrease in the electric power used.

"The new infrastructure had a great effect on reducing the operational workload and costs as well. The operations workforce consisted of four people before the construction of new infrastructure, and it stayed the same even after. Before, if for example a server had to be set up or an OS installed, they had to go directly to the data center. In contrast, they can now perform almost all operations from their desks. As the workforce is small, optimizing operations is a must. Combined with the fact that we managed to unify our management environment, the workload of each staff member has been greatly reduced," Utsui says.

Future goal: consolidate database servers; high expectations for the new versions of RHEV

The private cloud-based infrastructure is key to future growth in the gaming industry.

"As for the next project, we almost completed Phase 1 of virtualizing and consolidating the frontend-related physical servers. In the future, we are thinking about doing the same with high I/O physical servers, such as database servers. While the virtualization of such servers is generally considered to be difficult, we want to further our cooperation with HP and Red Hat and take on the challenge," Utsui says.

In January 2012, RHEV3.0—the new version of RHEV— was announced and released in Japan. In addition, HP announced in February that it will work closely with Red Hat and start selling the OEM version of RHEV. GMO Media has high expectations regarding these new developments.

"I heard that in the new version of RHEV, automated functions will be improved. I would be really happy to be able to automate server deployment and scaling out, which is currently performed manually. Furthermore, HP starting an OEM business of RHEV means that the relationship between a global vendor and open-source software has become even stronger, and GMO Media, which uses OSS to develop its business, welcomes it most warmly. We would like to build an even stronger relationship with HP," Utsui concludes.

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4AA4-2301ENW, Created June 2012