Leading Provider Improves Service Base with Support of Cisco Nexus 7000 Series Data Center

Yahoo Japan Corporation

EXECUTIVE SUMMARY

YAHOO JAPAN CORPORATION

- Headquarters: Roppongi Hills Mori Tower, 6-10-1, Roppongi, Minato-ku, Tokyo, 106-6182 Japan
- Establishment: January 1996
- Number of Employees: 3,449 (As of Jun 30, 2008)
- Sales: 262,027 Million yen (FY07)

BUSINESS CHALLENGE

- Yahoo Japan Corporation has constantly expanded its data centers in order to provide better services, deal with increasing access, and improve service continuity through disaster recovery. For better server capacity and disaster recovery functionality, the company decided to open a new data center.
- The company has introduced various approaches, such as standardized configuration, into the new data center to facilitate floor-based expansion. To maximize the effects of these approaches, the company required a core switch that can provide greater scalability.
- Immediately after receiving a presentation on Cisco Nexus 7000 Series in April 2008, Yahoo Japan Corporation started to look at it as a prospective core switch for the new data center. Based on the test results for operability, stability, switching at failure, and so on in the production environment, the company selected Cisco Nexus 7000 Series.

NETWORK SOLUTION

- Cisco Nexus 7000 Series

BUSINESS RESULTS

- The Cisco® Nexus 7000 Series can support a maximum of 512 10Gb ports for each chassis, and enables Yahoo Japan Corporation to organize 250 racks of edge switches per floor into a single chassis.
- The company had already implemented many Cisco Catalyst® 6500 Series switches as data center core switches, and valued their superior operation functions. Also, the company is actively utilizing functions of the Cisco Catalyst 6500 Series for their services, and therefore required a new core switch to support these functions as well. Fully satisfying this requirement, the Cisco Nexus 7000 Series enables the company to directly apply its established operation structure to the new data center.
- Also, Yahoo Japan Corporation values the Cisco Nexus 7000 Series in that it can provide operational continuity during operating system upgrade and stability under high-load situations, and help ensure switching at failure. These features were already tested in the production environment and expected to be greatly helpful to increase availability of the new data center.

Business Challenge

Since its establishment in January 1996, Yahoo Japan Corporation has been leading the Japanese Internet industry. The company selected the Cisco Nexus 7000 Series as the core switch for its new data center. The major reason is the high scalability of the Cisco Nexus 7000 Series. The standard configuration for data centers in Yahoo Japan Corporation is 250 racks per floor, and the Cisco Nexus 7000 Series can organize all of the edge switches in these racks into a single chassis. Yahoo Japan Corporation has been a Cisco customer for a long time and is happy to continue their commitment by investing in Cisco Nexus 7000 for the reasons mentioned in this case study. The Cisco Nexus 7000 Series can accommodate such existing operational structure, which is another important reason for the selection. The availability, reliability, and stability of the Cisco Nexus 7000 Series are also valued. The company is placing high expectations on the Cisco Nexus 7000 Series as the ‘core’ of the next-generation data center.

New Data Center for Stable Service Provisioning

Still, various Internet services are rapidly spreading. A wide variety of information and services are provided on the Internet, and the number of user accesses is increasing. To keep up with the increasing traffic, continuous expansion of data centers is necessary. Also, as Internet services are becoming parts of our lives and businesses, demands for availability and reliability are rising. As a result, redundant configurations are more and more applied to servers and data centers.

Since its establishment in January 1996, Yahoo Japan Corporation has been leading the Japanese Internet industry through operation of the nation's largest-class portal site, "Yahoo! Japan." The company has addressed the needs from users by constantly scaling its data centers up. The fields for the company's services, including "Yahoo! Auction" and "Yahoo! Shopping," are expanding. Now, the company provides about 140 types of services. Recently, the amount of traffic to the consumer-generated media (CGM) service, "Yahoo! Chie-bukuro," has surged. In July 2008, the company introduced a new advertisement service called "Interest Match," which is linked to users' interests, and is attracting high expectations from advertisers. Considering the fact that it has more than 1.4 billion page views per day, it is not too much to say that the company's portal site already constitutes its key infrastructure.

The number of racks placed to provide the above-mentioned services exceeded 2000 in total in 12 years. The number is still increasing at the rate of doubling every three years. To house these racks, Yahoo Japan Corporation already has several data centers. In October 2008, the company opened a new data center to reinforce its service base.

Tetsuya Nishimaki, CTO and senior manager of the Supervising Division, Yahoo Japan Corporation says, "Though the major purpose of constructing the new datacenter is expansion of rack capacity, we also expect it will help to enhance our disaster recovery capabilities." Yahoo Japan Corporation has already developed an environment that supports disaster recovery for mission-critical services and plans to apply the environment to all of the services. Recently, the company increased its focus on sustainability of the Internet and human society, and disaster recovery for the data center is a part of such effort.

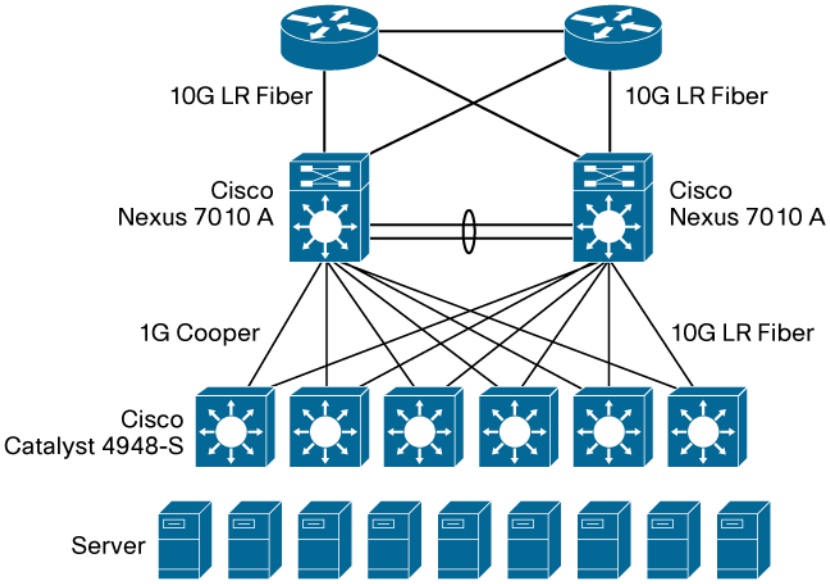
Initially the new data center had 250 racks for one floor. Using it as the base, the company intends to expand the data center as required. The Cisco Nexus 7000 Series was selected as the core switch for the new data center.

> "Though the major purpose of constructing the new datacenter is expansion of rack capacity, we also expect it will help to enhance our disaster recovery capabilities."
> **—Tetsuya Nishimaki, CTO and Senior Manager, System Supervising Division, Yahoo! JAPAN**

> "Cisco Nexus 7000 Series is one of the best among core switches."
> **—Norifumi Matsutani, Manager, Site Operations Division, Yahoo! JAPAN**

Superior Scalability and Operability of The Cisco Nexus 7000 Series as Core Switch

"Initially, we thought to implement several Cisco Catalyst 6500 Series switches as core switches for the new data center," says Nobuhiro Takazawa, leader of Network 1 of the Site Operations Division, Yahoo Japan Corporation. This was because the company had used Cisco Catalyst 6500 Series switches as core switches and was satisfied with the performance, functionality, and operability.



We decided on the Nexus 7000 because of the scale, performance, and investment protection that can be achieved with the Nexus platform. Nexus 7000 is the only platform that can support 250 racks of edge switches. In Yahoo Japan Corporation, according to its standard configuration, existing data centers have 250 racks per floor. The company had to use two core switches (plus two backups for redundant configuration) for one floor or three core switches (plus three backups for redundant configuration) for three floors. “Placing more than one core switch on one floor is not an efficient allocation because it produces high traffic load among core switches. However, a single Cisco Nexus 7000 Series core switch can easily support 250 racks of edge switches. So, we determined it is the most suitable for our new core switch.”

The key event at which Yahoo Japan Corporation turned to the Cisco Nexus 7000 Series as a prospective core switch was a presentation of the Cisco Nexus 7000 Series at the headquarters of Cisco Systems Inc., in April 2008. When Mr. Matsutani and Mr. Takazawa made a trip to their head office, they visited Cisco to see the presentation. Immediately after that, Yahoo Japan Corporation started to examine whether the Cisco Nexus 7000 Series could be used as the core switch for its next-generation data center. Then, working with ITOCHU Techno-Solutions Corporation (CTC), the company moved into the functional test in the production environment.

As for the test, the greatest concern for Yahoo Japan Corporation was whether the new core switch would allow the company to continue to use the existing operational structure. The company has been utilizing functions of the Cisco Catalyst 6500 Series for its network operation. Therefore, the company wanted to apply such operational structure also to the new data center. “It is essential for us that the new core switch must support everything that can be done in the Cisco Catalyst 6500 Series. The production test proved that Cisco Nexus 7000 Series can fully satisfy this requirement,” says Mr. Takazawa.

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> **—Nobuhiro Takazawa, Leader, Network 1, Site Operations Division, Yahoo! JAPAN**

Of course, the Cisco Nexus 7000 Series was not the only candidate for the new core switch. Yahoo Japan Corporation made a comparative evaluation of several potential core switches, including those of other companies. However, “in terms of Layer 2/3 operation functions, Cisco products are more advanced than others,” says Mr. Takazawa. Cisco products enable more flexible device configuration and are easier to fine tune. As a result, Yahoo Japan Corporation finally selected a Cisco product, the Cisco Nexus 7000 Series, to use for the new data center.

Network Configuration for New Data Center in Yahoo Japan Corporation

Proven High Availability and Reliability Available for Future Network Virtualization

The port capacity and operability of the Cisco Nexus 7000 Series are just part of the reasons for the selection. Yahoo Japan Corporation values the high availability and reliability of the product as well.

“Using the Cisco Nexus 7000 Series, we can upgrade operating systems without downtime. When I confirmed the fact through the production environment test, I was so impressed!" says Yasuhiro Morohashi, leader of Network 3 of Site Operations Division, Yahoo! JAPAN. Although in general, maintenance of core switches can potentially lead to a serious failure, the Cisco Nexus 7000 Series resolves such concern. The production test also verified stability under high loads, failover at the time of power-off, and switching due to partial down-time of load balancers. Mr. Matsunaga says, “It often happens that functions do not work in the production environment even though specifications say they should. However, the Cisco Nexus 7000 Series proved that all of its functions work properly. The test was so smoothly completed that I was a bit depressed.”

The 10Gb high port density of the Cisco Nexus 7000 Series is also attractive for the company. The Cisco Nexus 7000 Series enables a maximum of 512 10Gb ports to be implemented on a single chassis. This can be a great advantage in addressing increasing traffic.

In addition, the company expects that advanced virtualization functions, which the Cisco Nexus 7000 Series can provide through its integrated fabric architecture, will have a positive influence on the future of the company’s data centers.

Mr. Nishimaki says, “We plan to make our data centers ‘green’ by minimizing waste of resources while improving their operability and availability through server virtualization.” Demands for virtualization functions are expected to rise also in the field of network devices. “Ideally, networks themselves should work as ‘black boxes’ from the view point of service providers. For this purpose, we are making efforts including standardization of work flows, and virtualization will help our efforts.”

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Various Mechanisms for Floor-based Expansion Assisted by the Cisco Nexus 7000

In September 2008, as a part of network construction, Yahoo Japan Corporation deployed the Cisco Nexus 7000 Series in the CTC environment for future production operation. These switches are to be moved to the new data center in the middle of October. As mentioned above, at first, the

new center started its operation with 250 racks for one floor. However, if the number of racks continues to increase at current rates, the data center will grow to 1000 racks after three years. To respond to such situation, Yahoo Japan Corporation incorporates various methods that enable floor-based expansion into the new data center. The Cisco Nexus 7000 Series is also playing a big part in these methods.

“Cisco can deliver what competitors cannot. It’s really worthwhile,” Mr. Takazawa says. Mr. Matsuzawa adds, “The Cisco Nexus 7000 Series is one of the best among core switches.” Nevertheless, the final judgment will be made when the first floor becomes full of servers. “When adding the next floor, we can honestly say, “Our decision on the configuration was right!”—If the new data center brings such experience, we would be happy."

Profile

Yahoo Japan Corporation, an Internet information search service provider in Japan, was founded in January 1996. Since then, known as a pioneer in the internet portal industry, the company has been leading the Internet service business. Now, the number of types of its services rises to about 140, and the number of accesses per day exceeds 1.4 billion page views. It's not an exaggeration to say that these services, as integral factors, constitute the company’s key infrastructure. Also, the company is actively engaged in social contribution programs, including those that respect intellectual property rights and sustainability.

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