Cisco Nexus Family helps Alibaba Group Open the Doors to Future Riches

E-commerce giant Alibaba Group prepares for upcoming growth with a Unified Data Center Fabric built on the Cisco Nexus 5000 and 2000 Series switches.

EXECUTIVE SUMMARY

The Alibaba Group

- World leader in e-commerce, business-to-business trade and management
- Serves over 40 million users from more than 240 countries and regions

Challenge

- Availability and performance of datacenters impacted as user base grows
- Limited scalability for future applications and hardware
- Complex network cabling

Solution

- Cisco Nexus 2000 and 5000 Series switches

Results

- Enhanced user experience and satisfaction with better connection and application availability
- Increased throughput of servers to 10GE.
- Optimal costs and maintenance fees due to unified server geography
- Stable base for future expansion

Introduction

Emerging from a single apartment unit in Hangzhou, China, the Alibaba Group burst onto the global e-commerce scene with Alibaba.com - a web service which expedites B2B trade all over the world – to become one of China's first online businesses. Eventually breaking even in 2002, Alibaba.com has gone on to reap tremendous profits - resulting in an initial public offering on the US NASDAQ in 2007.

Apart from Alibaba.com, the Alibaba Group has diversified its efforts with other e-commerce sites such as Taobao.com, Alipay, Alimama, Alisoft and Yahoo Koubei!, an online classified service collaboration between Yahoo! China and the Alibaba Group. These web services expand the Alibaba Group's business portfolio to include services like retail websites and business management solutions, making it one of the largest and most comprehensive providers of internet retail and B2B services. On these sites, Chinese and foreign firms trade everything from lumber, building materials and heavy machinery - to iPods, televisions, and stationery.

Alibaba's web offerings are currently utilized by over 40 million users from more than 240 countries and regions. As this customer base continues to grow, the Alibaba Group aims to expand its current network capabilities to handle the demands of its users.

Business Challenge

"Our primary concern has always been catering to rapid growth in our user base," said Zhou Ming, technical manager for Alimama.com. "As our CEO has stated, 2009 will be a year of investment. Plans are underway to increase staff size by 30 percent[1], and we needed to make sure our data centers were prepared."

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[1] http://pcworld.about.com/od/webbasedapplications/China-s-Alibaba-Says-Profit-Do.htm

Being a platform that links millions of buyers to the appropriate suppliers, most of the bandwidth usage is taken up by activities such as search queries and trades, both from external customers, as well as from internal employees. "The websites have to be robust enough to handle hundreds of thousands of concurrent queries," said Zhou.

Transactions are processed by up to 10,000 web servers (both physical and virtual) in Alibaba's server farm. To ensure that the web server farm could keep up with increasing server traffic, throughput between the server links needed to be increased. "Server traffic was already approaching 800 Mbps, near the limits of our existing Gigabit interface. We have to constantly increase network bandwidth in tandem with our user base," said Yang Kai, systems engineer of alimama.com.

The clustered web server farms have also resulted in a complex network architecture that is hard to manage. A unified Ethernet interface would allow servers to connect to any network as needed, facilitating faster rollout of applications and services. "We hope to improve network management by reducing the number of cables, as well as create a highly virtualized data center architecture so that we can allocate storage, computing, and network resources in a flexible way. This would also result in better fault identification and remediation within our systems as well as helping us minimize network complexity" said Yang.

Solution

As an existing customer of Cisco, the Alibaba Group had no qualms about returning to their trusted technology provider to further improve their data center infrastructure. The Cisco team, with support from Alibaba IT personnel, proposed the Cisco Nexus 5000 and 2000 Series switches to provide the line-rate connectivity between web servers. "The capabilities of the Nexus 5000 and 2000 Series convinced us that it was a suitable choice. Their high port density, virtualization controls and cost-effective pricing made them the winning candidate for our network requirements," said Yang.

This network solution brings Alibaba another step forward along its journey toward the Cisco Data Center 3.0 vision. "The objective is to create a fully virtualized data center composed of pools of computing, network, and storage resources - with automated management and provisioning capabilities," said Zhou.
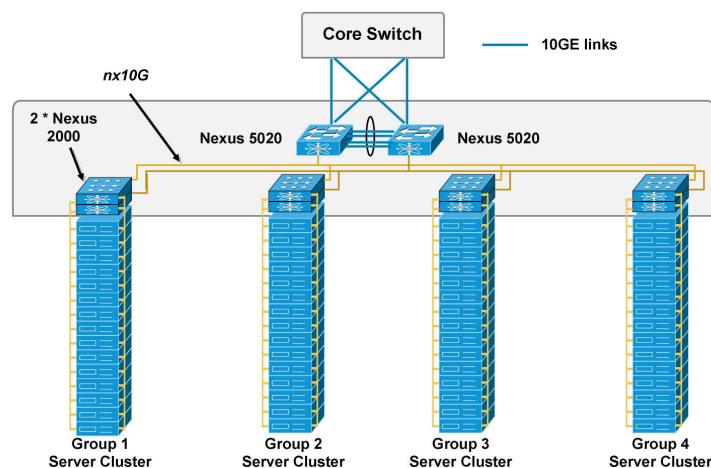
Figure 1: Physical topology of Alibaba's web server infrastructure.

Between February and May 2009, the organization deployed 8 units of Nexus 5000 Series switches and 16 units of Nexus 2000 Series switches in a redundant network topology, in an initial deployment phase that linked up to 300 web servers. By deploying two sets of Nexus 2000 Series switches per server cluster, each cluster could support up to 48 servers at once. "The deployment was carried out smoothly and we were able to easily plug the servers in to get up and running quickly," Yang added.

Results

The new data center network has greatly improved the performance of Alibaba's websites. "We are registering better user feedback regarding the response times of our web applications. The Cisco Nexus 5000 and 2000 Series switches have made this possible with its low latency, lossless fabric, and IEEE network congestion management tools," said Zhou.

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Overall network throughput has increased as well. "The setup is more than capable of handling current and future levels of customer requests," said Yang. "We are experiencing faster response times, with easier management and flexibility to deploy new servers in the future."

The Alibaba network can now be easily scaled according to changing business needs, thanks to the flexibility of the Cisco Nexus 5000 and 2000 switches. The Nexus 2000 switches allow Alibaba's server networks to be upsized according to specific requirements while the Nexus 5000 provides more ports for the future addition of 10GE hardware applications. "The Cisco

Nexus switches give us the flexibility to accommodate current and upcoming network demands," said Zhou.

Alibaba has also simplified its network structure with the help of the Nexus switches. "With 10GE support, we were able to resize our web servers into a more compact rack formation. In addition, we are now able to pack more virtual servers into our physical servers while still providing adequate bandwidth," said Yang. "With Cisco's end-to-end network management, our engineering teams can rapidly pinpoint and fix 'choke points' in our system, leading to seamless operational flow," he added.

PRODUCT LIST
• Cisco Nexus 5000 and 2000 Series Switches

Next Steps

The implemented Cisco solution has helped Alibaba solidify their strategy for future growth. "Improving server cluster throughput is just the beginning," said Yang. "Now that we have the Cisco Nexus 5000 and 2000 deployed, we're ready to create a unified network fabric, where storage and server networks can be consolidated over a single network backbone."

For example, Alibaba will now be able to combine SAN and LAN connectivity onto a single 10GE link, using Fiber Channel over Ethernet cabling (FCoE), to drastically reduce the number of network interfaces and cablings in their data center.

With Cisco, Alibaba is now empowered with features that will ensure its market-leading reputation as a powerhouse of e-commerce.

For More Information

For more information on the Cisco Nexus 5000 Series, visit:
www.cisco.com/en/US/products/ps9670/index.html
For more information on the Cisco Nexus 2000 Series, visit:
www.cisco.com/en/US/products/ps10110/index.html
For more information on the Alibaba Group, visit:
www.alibaba.com/aboutalibaba/aligroup/index.html