Russia's Mail.Ru Meets Huge Demand and Simplifies Data Center Design with Juniper Networks

Summary

Company:

Mail.Ru Group Limited

Industry:

Internet

Challenges:

- Support double-digit growth while ensuring network availability
- Deliver services even during periods of peak demand
- Simplify network operations

Network Solution:

- Juniper Networks EX4200 Ethernet Switches
- Juniper Networks MX960 3D Universal Edge Routers

Results:

- Achieved 100% uptime to date and improved network stability
- Maximized network capacity to handle peak traffic
- Simplified access layer using Virtual Chassis technology
- Consolidated core switch and Internet gateway functions to reduce data center footprint

Mail.Ru is one of the largest Internet companies in the Russian-speaking market, providing e-mail, online gaming, social networking, and electronic payment services. Mail.Ru portal achieved a monthly audience of 31.9 million users as of September 2012, while its social network Odnoklassniki (OK) reached 21.8 million users per month.[1] Mail.Ru is on a double-digit growth trajectory with revenues of $515 million in 2011, up 58.7% from the previous year.[2]

The continued success of Mail.Ru depends on the introduction of new and innovative multimedia applications that keep both its advertisers and audience coming back for more. Mail.Ru recently introduced a homepage that was modern, lightweight, and fast. It also released mobile e-mail for Apple iOS, debuted music and chat on its OK social network, and launched Warface, a large-scale multiplayer online game, along with several social and mobile games developed in-house.

Challenges—Delivering an Always-On Experience

Engaging millions of users every hour of every day is a challenge.

"Downtime is a big problem for any online company," says Pavel Zavyalov, deputy CTO, Mail.Ru. "An online company cannot hit the 'Stop' or 'Pause' button. There is financial and reputational damage even if you are down for one hour. Users will move to other companies."

Delivering an always-on experience means that Mail.Ru's IT infrastructure must be ready for anything. Traffic is highly variable, and a software update to one of its hugely popular multiplayer games can spike traffic. The OK social media site and mobile e-mail also cause unpredictable and large increases in user demand.

Mail.Ru must continuously evolve its data center design with the latest technologies to support the steady growth and peak demand from users. Its legacy data center network was based on two tiers—core and access—and the company used network virtualization to simplify configuration and operations.

"The EX Series switches with Virtual Chassis technology give Mail.Ru flexibility in expanding the data center capacity."

Vladimir Treukhov, Head of Network Operations Center, Mail.Ru

[1] Mail.Ru Group Limited Preliminary Trading Update for Q3 2012. **http://corp.mail.ru/en/IR/news/1545**

[2] Final audited IFRS results for FY 2011 and preliminary revenue update for Q1 2012. **http://corp.mail.ru/en/IR/news/1379**.

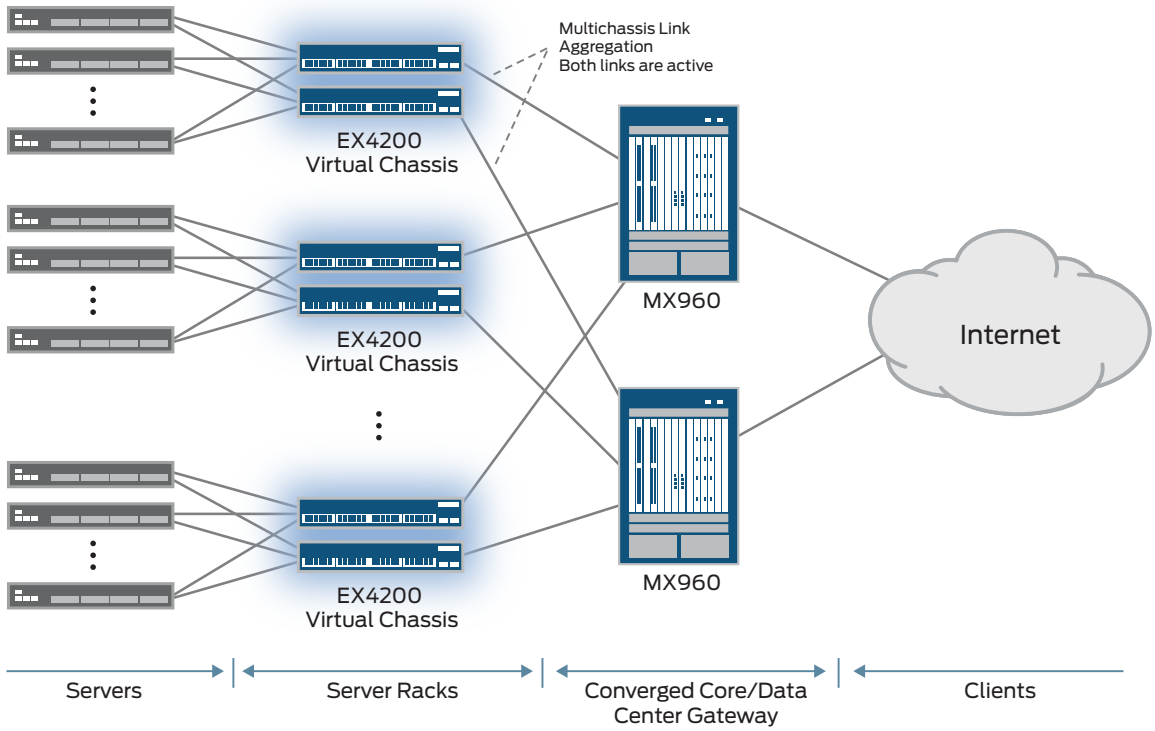

Figure 1: Mail.Ru uses MX960 routers as the core of its data center network to deal with huge traffic spikes and for Internet peering. It uses EX4200 Ethernet switches deployed in Virtual Chassis configurations to connect thousands of servers in its Moscow data center.

Like many Layer 2 networks, the legacy switches relied on Spanning Tree Protocol (STP) for network resiliency when a link failed. But the inherent inefficiencies of STP increased operational overhead and reduced network efficiency by blocking half of the redundant links. If a link failed, STP was slow to determine the network path, which made the network unreliable. Ultimately, the use of STP made it more difficult to deal with the huge spikes in traffic that occur when Mail.Ru updates software for its most popular games, browsers or IM clients.

Selection Criteria—A Data Center Built to Scale

Mail.Ru needed a new network for its primary data center in Moscow. The company wanted an infrastructure that was highly available, reliable, and cost-effective. It needed a solution that could help it deal with peak loads by providing full access to the network capacity. It also wanted to eliminate STP to improve network reliability. Operational simplicity was a must, as the data center infrastructure is managed by just three network engineers.

Mail.Ru issued a RFP to three leading data center switching vendors and conducted a thorough evaluation of the products. "The selection of Juniper was based on price and performance," says Vladimir Treukhov, head of Mail.Ru's network operations center.

Solution

Mail.Ru deployed a new Juniper-based network in its primary data center using the Juniper Networks® MX960 3D Universal Edge Router and Juniper Networks EX4200 Ethernet Switch. The MX960 3D Universal Edge Routers provide core switching functions and also serve as the company's Internet gateway, while the EX4200 Ethernet Switches support more than 4,500 servers in its data center. "Port density was one of the most important requirements of the switches, which allows us to support more servers with fewer switches," says Treukhov.

The MX960 router offers powerful switching and security features that deliver unmatched flexibility, versatility, and reliability to support advanced services and applications. The MX960 router separates control and forwarding functions to provide maximum scale and intelligent service delivery.

Mail.Ru uses many of the advanced features of Juniper Networks Junos® operating system that runs on the MX Series routers, as well as the EX Series switches. For instance, it uses Multichassis Link Aggregation Group (MC-LAG) operating in active/active mode on the MX Series router to improve network resiliency and use the full capacity of the interconnection between the core and access layers. This enables Mail.Ru to accommodate peak traffic loads in a highly efficient way. "We

use MC-LAG on the MX Series for resiliency and improved utilization over the internal links," Treukhov says.

Mail.Ru also uses the core MX960 routers for peering on its 720 Gbps Internet connection. Data center space is at a premium in Moscow, and consolidating the core and gateway functions on the MX960 routers allows Mail.Ru to use its data center space more efficiently. The MX960, with both Layer 3 and Layer 2 feature sets and a highly scalable routing table, supports consolidation without a performance penalty.

The EX4200 line of Ethernet switches, designed for access and aggregation deployments, delivers the best of modular, chassis-based systems in a compact and efficient form factor. What makes the EX4200 line unique is Juniper's Virtual Chassis technology, which allows up to 10 switches to be interconnected over a 128 Gbps backplane to create a single, logical device. All EX4200 switches in a Virtual Chassis configuration share a common Junos OS and configuration file, greatly simplifying operations, maintenance and troubleshooting as well as reducing management overhead.

Using EX Series Ethernet Switches with Virtual Chassis technology has enabled Mail.Ru to reduce the number of network elements thereby simplifying the access layer. With the EX Series switches, Mail.Ru has increased the 10GbE density and improved scalability of its networks.

"The EX Series switches with Virtual Chassis technology give Mail.Ru flexibility in expanding the data center capacity," says Treukhov. "Another benefit is the fact that the EX Series switches have a Layer 3 feature set, which we use in some deployments. It is an advantage to have Layer 3 and Layer 2 on the same platform in terms of keeping spares and making the network more flexible."

"Mail.Ru's business is very dynamic and the company is growing fast. One success factor is the ability to expand the network both in terms of performance and new features. The new network from Juniper allows us to meet the needs of our business as it grows."

Pavel Zavyalov, Deputy CTO, Mail.Ru

Results—Simplified Network Operations, Ready for Peak Performance

Mail.Ru uses the MX960 routers to provide virtual private LAN service (VPLS), BGP, and other services to other companies in the Mail.Ru group. Connectivity is provided via a VPLS domain using pseudowires, which allows the provider edge routers to act as a single virtual Ethernet bridge to these subsidiary companies.

Running a single, consistent Junos operating system across both the MX Series and EX Series products reduces the time and effort Mail.Ru needs to plan, deploy, and operate the network infrastructure. Junos OS utilizes a single release train, ensuring stable delivery of new functionality. And with a modular software architecture, Junos OS is highly available and scalable software that keeps up with changing needs.

"The network operations guys like the Junos operating system," says Treukhov. "They use the feature which allows them to commit and roll back changes. If something goes wrong, they can automatically restore the previous configuration with Junos OS."

"Mail.Ru's business is very dynamic and the company is growing fast," says Zavyalov. "One success factor is the ability to expand the network both in terms of performance and new features. The new network from Juniper allows us to meet the needs of our business as it grows."

Mail.Ru has reduced downtime since deploying the Juniper network in its data center. Issues related to congestion and packet loss that used to occur during peak periods such as software updates to online games have been resolved. "We have reduced downtime and traffic loss," says Treukhov.

Next Steps and Lessons Learned

As Mail.Ru continues to expand its network infrastructure, it plans to use the same successful design for its data center infrastructure.

For More Information

To find out more about Juniper Networks products and solutions, please visit www.juniper.net.

About Mail.Ru

Mail.Ru Group Limited is an Internet company offering a variety of online communications products and entertainment services for Russian speakers all over the world. The company operates in four segments: e-mail, portal, and instant message; social networks; online games; search, e-commerce, and other. The e-mail, portal, and instant message segment includes e-mail, Mail.Ru Agent, ICQ LLC (ICQ) instant messaging services, and the Mail.Ru portal. The social networks segment includes Odnoklassniki (OK) and Moi Mir (My World) social networks. The online games segment comprises its browser-based, client-based, mobile and social games. The search, e-commerce, and other category include search services and e-commerce projects.

About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at www.juniper.net.

Corporate and Sales Headquarters
Juniper Networks, Inc.
1133 Innovation Way
Sunnyvale, CA 94089 USA
Phone: 888.JUNIPER (888.586.4737)
or +1.408.745.2000
Fax: +1.408.745.2100
www.juniper.net

APAC and EMEA Headquarters
Juniper Networks International B.V.
Boeing Avenue 240
1119 PZ Schiphol-Rijk
Amsterdam, The Netherlands
Phone: +31.0.207.125.700
Fax: +31.0.207.125.701

3520437-001-EN May 2015