



FOUNDRY
NETWORKS

CASE STUDY: THE LONDON INTERNET EXCHANGE (LINX)

Foundry and London Internet Exchange: Powering the Internet at 10 Gig Speeds

LINX

SUMMARY

The London Internet Exchange (LINX), one of the largest Internet Exchange Points (IXPs) in the world, offers cost-effective Internet peering to content delivery providers and ISPs. Service providers from across the globe join the not-for-profit organization to exchange Internet traffic over more direct routes and at reduced costs.

During the last four years, LINX membership has spiked from 120 to 220 organizations. The members, a demanding group of the leading content delivery and Internet Service Providers, generate a huge volume of Internet traffic across the LINX network. Traffic has increased at a rate of 50 percent each year the past few years. This annual increase means LINX currently supports more than 116 Gigabits of traffic per second.

OBJECTIVE

To accommodate a burgeoning membership and rapidly increasing traffic volume, LINX needed to raise its bandwidth capacity. LINX supports as much as 95 percent of all U.K. Internet traffic, as well as traffic from around the world.

LINX realized it needed to add more powerful network infrastructure components to meet escalating member requests for Gigabit Ethernet (GbE) and 10 Gigabit Ethernet (10GbE) port connectivity. LINX sought the most technologically advanced, high-performance equipment at the most cost-effective price.

“We knew we’d have to buy new chassis to cope with customer demand. Switch technology has jumped a lot recently and next-generation products are faster and cheaper than what was considered leading edge just 12 months ago,” says Mike Hughes, chief technology officer at LINX.

SOLUTION

A long-term Foundry customer, LINX was familiar with Foundry’s equipment and reputation for best-in-class support. A number of Foundry solutions were already deployed within the LINX network, including the 10GbE BigIron® MG8 switches released in 2002.

On the basis of its positive experience with Foundry, LINX chose the elite BigIron RX. The BigIron RX allows LINX to easily support spikes in the traffic volume and to support new member requests for Gigabit Ethernet and 10 Gigabit Ethernet port connectivity.

“We’re getting twice the gig and 10 gig port densities with the RX switches at half the cost of other solutions,” says Hughes.

In addition to increased bandwidth capacity, the BigIron RX will support sensitive, real-time traffic such as voice, video conferencing, and webinars. Because these contemporary applications demand network reliability, LINX requires advanced routing technology that supports hitless failover.

WWW.LINX.NET

INDUSTRY

Internet Service Provider

COMPANY DESCRIPTION

The London Internet Exchange (LINX) connects the networks of content delivery and Internet Service Providers so that traffic may flow more efficiently between them. LINX is one of the largest exchange points globally, measured both in terms of the traffic that passes over its network and the Internet routes which are directly accessible from its peering LAN. Today LINX has more than 220 members—both ISPs and content delivery service providers—from the U.K., mainland Europe, the USA, Africa, and the Far East handling up to 95 percent of all U.K. Internet traffic.

OBJECTIVE

- Increase bandwidth capacity to support surge in network traffic that has risen to 116 Gigabits of traffic per second
- Support increased demand from member organizations for Gigabit Ethernet and 10 Gigabit Ethernet port connectivity
- Improve network performance by adding technologically advanced, cost-effective switches that reliably support spikes in Internet usage and traffic disruptions

SOLUTION

- Foundry BigIron RX-16 Layer 2/ Layer 3 Ethernet switches deliver 10 Gigabit Ethernet in the network core and provide full system redundancy (switch, management, and power) for the LINX network
- LINX relies on BigIron RX-16 and Metro Ring Protocol II to support a virtual 40 Gigabit Ethernet core by trunking together four 10 Gigabit Ethernet links. Smaller 10 Gigabit Ethernet rings connect to the network through BigIron MG8 switches.

RESULTS

- Foundry solutions supported LINX as its membership nearly doubled from 120 to 220 content delivery providers and ISPs in four years
- With Foundry BigIron RX switches in the network, LINX increased Gigabit Ethernet and 10 Gigabit Ethernet port density, supporting an annual traffic increase of 50 percent per year
- BigIron RX switches deliver the capacity to support real-time applications and non-stop operation

RESULTS

The LINX began evaluating the BigIron RX in early 2006. The IT team tested the switches thoroughly in the LINX laboratories, paying close attention to software functionality and forwarding performance. The BigIron switch's performance exceeded the organization's demanding requirements.

Adding the BigIron RX into the LINX network has given the organization the bandwidth capacity it needed. The LINX strategy calls for building excess capacity into the network so that LINX does not have to apply queuing methods such as quality of service to resolve congestion.

The additional capacity and advanced technology inherent in the BigIron RX allow LINX to easily support its members' critical, real-time applications. "Our testing showed that, compared to the competition, the RX switches have very low jitter. In other words, the delay in the frames going through the box is uniform and packets are not dropped," explains Hughes.

The BigIron switches have multiple advanced features that help ensure non-stop operation. The Foundry Metro Ring Protocol II (MRP2) enables multiple network rings to be created with a shared link without creating single points of failure. LINX used this protocol to deploy a virtual 40 GbE core in which the BigIron RX switches trunk together four 10GbE links. Smaller 10 gigabit rings connect to the core through existing BigIron MG8 switches.

MRP2 is the key to ensuring that the LINX service is reliable. Should a break in Internet transmission occur, perhaps because of an equipment failure or cable being cut during road work, MRP2 establishes an alternative traffic route in milliseconds to maintain network service.

MRP2 also promotes control plane stability, which is becoming important for the ISP community due to the growth in time-sensitive traffic and the increase in routing tables. These tables are integral to Internet activity.

Hughes explains, "If a long-term outage occurred at the LINX, people would have to reconfigure their forwarding tables. This re-routing ripples out to the ISPs and their customers, slowing down Internet traffic. MRP2 maintains network efficiency."

LINX expects that it will continue to attract new members and require more bandwidth capacity. As traffic demand increases, LINX will continue to look to Foundry for help in scaling the network and preparing for future network requirements.

"One of the key things about Foundry is the ease at which equipment can be upgraded, with next-generation solutions interoperating with existing products. We'll need so-called RX-32, RX-64, and RX-128 switches to keep up with our escalating demand. In three years, I'll be looking for a box the same size as the current BigIron RX-16 but with the same number of 100 Gigabit Ethernet ports as there are 10 Gigabit Ethernet ports today. It's good to see Foundry thinking about making the RX-16 chassis 100-gigabit ready."

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— Mike Hughes
Chief Technology Officer
London Internet Exchange

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