Case Study

Internet Data Center

Cloud Service Provider Upgraded UK Data Centre with FS Spine-Leaf Architecture

This UK data centre upgrade helped the cloud service provider reduce network congestion, improve service reliability, and support growing backup and ISP workloads. With the FS 25G/40G spine-leaf architecture and MLAG Active-Active design, the customer achieved higher bandwidth capacity and simpler future expansion.

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Region
United Kingdom

Industries
ISP

Network Type
Access Networks

Solutions
Internet Data Center

Highlights

- Reduced peak-time network congestion, improving east-west traffic efficiency and ensuring stable ISP and data services.
- Improved network availability through an Active-Active architecture, reducing single points of failure and enhancing business continuity.
- Increased bandwidth and port capacity without additional rack space, improving overall data centre capacity.
- Simplified future expansion and operations through a standardised Spine-Leaf architecture, reducing upgrade and maintenance complexity.

Key Stats

- Built on a Spine-Leaf architecture with 2 × S8550-6Q2C spine switches and 2 × S5850-48B8C leaf switches.
- 40G spine-layer connectivity with MLAG Active-Active design for resilient high availability.
- Scalable design supporting smooth evolution from 25G/40G to 100G/400G backbone upgrades.
- 2–3 weeks from solution design to deployment, achieving rapid end-to-end delivery.

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Overview

The customer is a cloud service provider with data backup and cloud storage operations in the UK, providing related services to enterprises, internet service providers, and telecommunications operators. Its data centre in London supports large-scale east-west traffic with strict requirements on bandwidth, reliability, and service continuity.

With rapid growth in cloud backup workloads and increasing data volumes, the existing network infrastructure has become a limiting factor for performance and scalability. The customer therefore required a next-generation data centre network capable of delivering higher throughput, improved resilience, and long-term scalability within a constrained physical footprint.

Challenges

As backup and ISP workloads continued to grow, the customer's existing 10G-based network architecture came under increasing pressure in performance, reliability, and scalability. During peak backup periods, sustained high link utilisation led to network congestion, resulting in longer backup windows and reduced overall operational efficiency. In terms of high availability, the customer's network design still relied on traditional redundancy mechanisms rather than a fully active-active forwarding model. As a result, when failures occurred, convergence delays could be introduced, affecting service continuity and posing risks to SLA compliance in latency-sensitive backup scenarios.

From a scalability perspective, the legacy three-tier architecture required coordination across multiple network layers when expanding capacity. Combined with limited rack space in the data centre, this made it increasingly difficult to scale bandwidth and port density in a simple and cost-efficient manner, creating constraints for future infrastructure growth.

Solutions

Following multiple rounds of technical evaluation, the customer decided to adopt a Spine-Leaf architecture for its data centre network upgrade, introducing redundancy and high availability to improve overall resilience. The network design optimises east-west traffic via a spine and leaf layer, delivering lower latency and better scalability than traditional three-tier architectures, and is well suited to large-scale backup traffic.

At the spine layer, two FS S8550-6Q2C switches are deployed with MLAG, enabling active-active redundancy and load balancing. In the event of a failure, traffic converges rapidly, ensuring service continuity and high availability. At the leaf layer, the FS S5850-48B8C switches function as leaf nodes and are fully interconnected with the spine layer. Uplinks operate in active-active mode, improving utilisation and accelerating convergence. Server connectivity is upgraded from 10G to 25G, while 40G Spine links provide end-to-end high-speed connectivity to support peak backup traffic.

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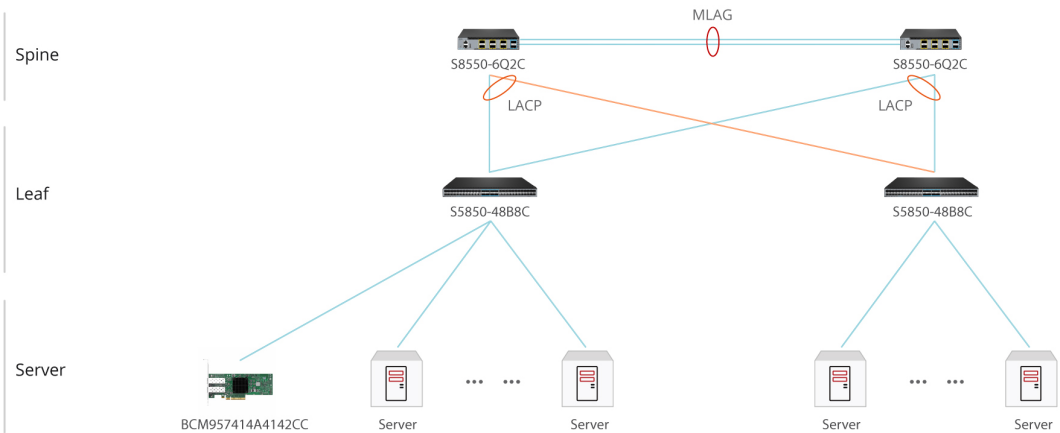
The customer also adopted FS 25G/40G optical modules and a server network interface card, working in conjunction with switching equipment to build a complete end-to-end high-speed connectivity solution, enabling a seamless network upgrade and overall performance optimisation. The architecture also supports horizontal scalability, allowing additional Leaf nodes to be added on demand without redesigning the core, thereby reducing future expansion cost and complexity.



Results

The upgrade significantly increased overall network performance and scalability within the customer's data centre environment. By migrating from 10G to 25G leaf and 40G spine, the solution delivered approximately 2.5–4× higher end-to-end bandwidth, reducing congestion during peak backup periods and enabling more consistent processing of high-concurrency ISP traffic. MLAG-based redundancy further enhanced device and link-level resilience, ensuring uninterrupted traffic forwarding during failure scenarios and improving overall service availability and SLA compliance.

In addition, the high-density switching design increased port capacity per rack by approximately 2–3×, reducing the requirement for additional rack expansion. The Spine-Leaf architecture also provides a simplified and scalable foundation for future network growth toward 100G and 400G evolution.

United States

Address: 380 Center Point Blvd, New Castle, DE 19720, United States

Tel: +1 (888) 468-9910

Email: US@fs.com

For more information, welcome to visit www.fs.com

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