Maximising capacity: How future-ready cabling solutions help data centres optimise their space

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The demand for data shows no sign of slowing down. First, there was the increasing adoption of cloud computing, the growing demand for virtualisation, big data, and video. Now, the internet of things, virtual/augmented reality, and artificial intelligence are driving an industry-wide push towards faster transmission speeds and a need for sophisticated fibre-management solutions.

Fortunately, today's networking technology enables data centre operators and facility owners to meet this challenge on a number of fronts, establishing a future-ready infrastructure capable of handling even greater network strains. Optimising data centre density is the industry best practice for adding capacity, as it's far more efficient and less costly than expanding the physical boundaries of the data centre.

There are many solutions that provide high-density capabilities, but the biggest challenge is "theoretical" vs. "usable" density. Data centre operators need to evaluate which solutions enable them to provide easily manageable, highly flexible, and scalable solutions that not only permit continuous moves, additions, and changes but also maintain the integrity of live circuits to reduce risk and maintain internal service-level agreements.

Corning has worked with data centre customers for more than 20 years to overcome these challenges and to deliver a range of solutions that provide the highest level of flexibility. Corning has been at the forefront of density solutions since the launch of our EDGE™ solutions back in 2009. Thanks to our recent EDGE8™ solution with universal wiring, we now enable port disaggregation of higher-speed 40/100G switch circuits to support 10/25G server connections. Port breakout modules deployed in the main distribution area can significantly reduce the number of line cards in the device for savings in both density and power requirements.

Corning's project with managed service provider Kinetic IT to maximise capacity in Telehouse North's colocation centre offers a great example of the transformative power of a high-density infrastructure solution and how the installation should be approached for maximum efficiencies.

The challenge: Maximising capacity and ensuring 24/7 high availability

Telehouse North is Europe's first purpose-built, carrier-neutral colocation data centre. One of four Telehouse data centres located at the Docklands campus in London, it is the primary home of the London Internet Exchange and one of the most connected data centres in Europe. It provides end-to-end information and communications technology solutions including managed services, integrated communications services, virtualisation services, content management, system security services, and disaster recovery services.

Telehouse's cabling infrastructure required an update in order to maximise capacity in its 9,717 square metre, highly secure colocation centre, which consists of 32 suites over multiple floors. A central hub room required a new cable management solution that would provide flexible and future-ready, intrabuilding connectivity to each of the five floors and customer colocation suites. Most importantly, the new central hub had to be operational within three months.

From an infrastructure perspective, the design had to meet a number of objectives. These ranged from the pressures of a strict project timeline and budget to resilience – namely supporting 100 percent diverse routing of connectivity to customer suites for high availability 24 hours a day, seven days a week.

Fundamental to the project was ensuring a high-density infrastructure solution by maximising port capacity within a small footprint and ensuring the infrastructure was flexible and scalable to changing business requirements and future growth.

The solution: Ultra-high density with Centrix™ system

Corning proposed an infrastructure solution designed around its Centrix™ system. The innovative design of the Centrix system enables an ultra-high-density deployment in a compact footprint and provides a scalable fibre management solution for cross-connect applications in the data centre's central hub. With superior patch cable management and an innovative fibre routing system, the Centrix system is a cross-functional solution that meets the requirements of multiple application spaces.

The Centrix system supports up to 4,320 LC connector ports per 2200 mm frame with a 900 mm wide, 300 mm deep footprint. The highest density of 17,280 optical fibre ports in one square metre is possible in a quad configuration.

The frame design provides optimised routing paths for patch cables, reducing the risk of entanglement, while the operations staff can install or remove a single patch cable in less than two minutes regardless of the cable route. To further simplify deployment and stock levels, the Centrix frame requires a single-length patch cable of just 4 m to connect any port(s) within the frame.

The foundation of the Centrix system is a modular cassette that can be tailored in a variety of ways to provide flexibility and functionality without sacrificing density. Each cassette contains fibre guides as well as a splice section, and it can hold 24 or 36 LC connector adapters. Telehouse personnel can easily access the fibre ports as the cassettes have a sliding mechanism with a drop-down handle.

Corning indoor/outdoor cables, typically 96 fibre, were terminated on cassettes within the Centrix frame and installed along diverse routes to each of the customer suites. These cables utilise low-loss Corning® SMF-28® Ultra fibre, which provides a solid foundation of high performance for the newly upgraded infrastructure. SMF-28 Ultra fibre offers industry-leading specifications for attenuation and macrobend loss. Low attenuation enables extended reach of network connectivity between locations, while 33 percent better macrobend performance than the G.657.A1 standard helps improve existing duct utilisation and the support of smaller enclosures.

The project involved the initial termination of over 16,000 fibre ports on the Centrix frame as well as the installation of cables to each suite. Completed in March 2016, within a 12-week timeframe, the installed system has the capacity to allow for expansion of up to 130,000 ports with the use of additional cabinets.

Telehouse is now able to provide fast and flexible provisioning of connectivity to suites and respond quickly to the changing business needs of its business customers. This installation will create the basis for future project stages, including the infrastructure in a new Telehouse building scheduled for completion later in the year.

Meeting tomorrow's data challenges

Network operators must realise that today's network is a living and growing entity. What seems like more than enough capacity will most likely not be sufficient for tomorrow. A successful, well-built network must be based on a strong fibre-cable management system that is flexible, simple, and provides superior density.