Spotlight on
From the Need for Speed to the Race for Space

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Hi Cindy, can you tell us about your role at Corning?

As Data Centre Marketing Manager for EMEA, I work across a very diverse region on Corning's strategy, planning and implementation of online and offline marketing activities and campaigns to reach end-users, consultants, planners and installers in the enterprise, colocation or multitenant and hyperscale data centre space.

Data centres are a very hot topic. Can you give us a picture of the data centre industry today?

It's a very fast-growing space, with new players, business models and technologies that are continuously evolving. What's really driving this growth is a need to support ever more rapid and seamless transition of data, with technologies like 5G, and the applications it supports, requiring huge volumes of data to be processed, analysed and stored.

Across a multitude of clients within those data centres of course; no two data centres are the same. What DO they have in common?

From tenants in colocation data centres that pay by space, to users that are reaching capacity in their own facilities, achieving higher bandwidth speeds, managing greater network density – and doing all this securely – is key. Choices in optical transceiver technology and optical interfaces for physical infrastructure connectivity have become more complex, so simplifying network design while preparing for future growth is a priority.

What tools do data centre operators have at their disposal to overcome this complexity?

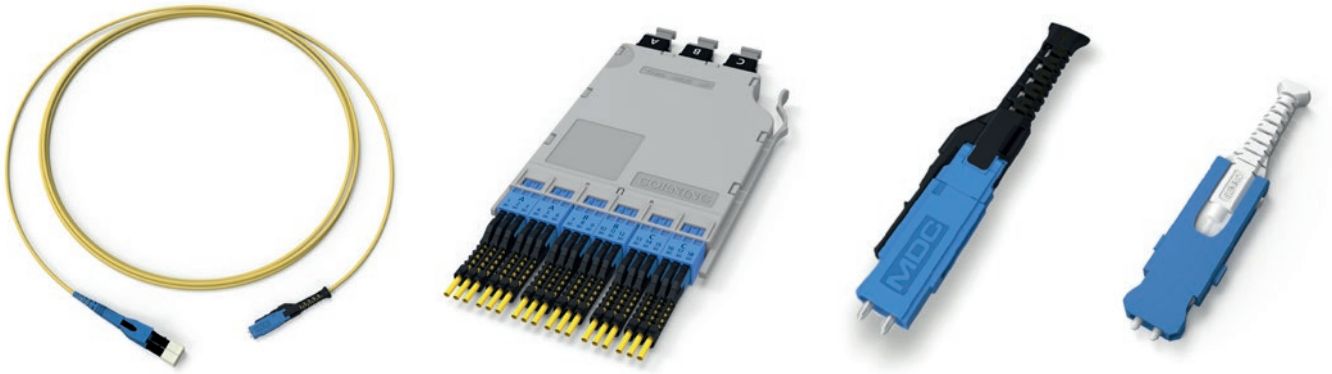
When it comes to higher data rates, it's not necessarily a matter of fully utilising 400G or 800G for each port today (in fact for many operators these speeds may still be far down the road) but of supporting the bandwidth requirements of 10/25/50G of the end devices.

Examples of this are Spine-Leaf connections with 4 x 200G or Leaf-Server connections with 400G ports, operated as 8 x 50G ports. Breaking out high speed ports into smaller bandwidths enables more energy efficient network operations as well as increased port density (32x 400G = 128 x 100G).

To achieve this, a variety of solutions exist, as well as new transceiver interfaces.

LC duplex and MPO/MTP® connectors (12/24 fibres) are the well-known interfaces for transmission speeds of 10, 40 and 100G. For the higher data rates we've discussed like 400G and 800G and beyond, additional Very-Small-Form-Factor connector (VSFFC) types such as MDC, SN and CS, as well as MTP/MPO connectors with 16 fibres in a single row have been introduced.

VSFFC formats provide the possibility of connecting directly from one high-speed transceiver to another transceiver and with their small footprint up to three of these fit into the footprint of an LC duplex, which provides an enormous density advantage.



What technological advances are paving the way to higher data rates and higher density networks?

We're in the early stages of a variety of advances that will help us achieve higher data rates – all the way up to 1.6T.

Beyond the VSFFCs, the high density and power consumption requirements mean that pluggable optics might not be the only (or best) solution going forward.

What about on the active equipment side?

Well, another approach is a co-packaged solution. Here, data transmission and data processing are coupled in semiconductor components. By doing this, co-packaged optics promise to increase density, reduce latency, reduce power consumption and the size of the switches. We have also seen conversations about on-board optics to help increase speed and system density, using more channels or lanes on the front of a small connector.

Further developments can be expected in the expanded beam area, resulting in more applications with connectors such as the US Conec MXC connector or the 3M EBO.

What about fibre?

We see developments such as reduced cladding fibres, decreasing the size of the fibre cables and ultimately enabling smaller size connectivity solutions. So essentially, we are talking about miniaturisation to optimise available space in ducts, raceways, enclosures and racks.

What last piece of advice would you give to data centre operators ahead of this transition?

The perennial priority (and challenge) for data centre operators is ensuring that the networking and structured cabling design remains flexible to minimise cabling infrastructure costs when the time to upgrade to higher networking speeds like 400G and 800G arrives.

Future proofing is so important. What else?

With sufficient fibre reserve planned, network adjustments can be implemented by replacing only a few components: for example, an upgrade from 10G to 40/100G or 400/800G can be implemented by replacing MPO/MTP to LC modules and LC duplex patch cords with MTP adapter panels and MTP patch cords without making any changes to the backbone (fibre plant).

Scalable use of the backbone or trunk cabling is given when the lowest common multiple serves as the basis. For duplex applications, this would classically correspond to "Factor 4", i.e., base-8 cabling, on the basis of which -R4 or -R8 transceiver models can be mapped. This type of cabling therefore supports both current technologies and future developments and, with minimal changes, it is possible to be prepared for the future.

For more information, see www.corning.com/data-center/emea/en/home.html