

Nominee: Corning Optical Communications

Nomination title: EDGE™ Mesh Modules

An increasing demand for real-time data access and cloud services is creating a pressing need for large data centres that can support enterprise development. As the spine-and-leaf network architecture grows in popularity to accommodate these data demands, Corning's EDGE Mesh Modules are emerging as a critical enabler for efficient installation and future-readying of these networks.

The spine-and-leaf network is easy scalable and agile to get low latency times combined with calculable expansion flow, but it also requires a huge number of physical connections, space requirements and operational effort. EDGE Mesh Modules combine typical meshing in a space-saving design, mitigating complexity and the resulting number of individual connections.

The solution ultimately provides operators of spine-and-leaf topologies with a granular and easily adaptable solution that supports current and future bandwidths, while also saving costs.

Key distinguishing features and/or USPs

- **Density:** EDGE™ modules provide the interface between the MTP® connector on the trunk and the LC Duplex patch cords that will then connect directly into electronics. MTP connectivity delivers a significant, 75% reduction in the amount of rack space required versus LC Duplex breakouts.

The solution also enables the number of patch cords at the main distribution area (MDA) to be reduced by up to 75% compared to conventional solutions for minimal congestion.

- **Reduced connections:** Reduces the number of links in the channel by eliminating the need to convert from LC to MTP and back again.

- **Reduced insertion loss:** High insertion loss can contribute to poor system performance and loss of coverage. EDGE Mesh Modules provide a 10% reduction in link attenuation compared to typical LC Duplex connectors.
- **Cost-savings:** EDGE Mesh Modules deliver a 45% lower connectivity cost than multimode LC Duplex modules.
- **Scalability:** Typical port breakout methods, used to grow networks in ways that were traditionally not possible, can lead to a number of performance issues. With EDGE Mesh Modules this process is significantly enhanced, negating the need for LC-to-LC patching and achieving full performances out of network switches.

The tangible impact on the market and customers

EDGE Mesh Modules are gaining traction in the market as customers face new technology challenges that require the efficient use of a spine-and-leaf network architecture.

IDC research has suggested that new IT systems, such as hyper-converged, dramatically alter data centre traffic flows and that as the volume of East to West traffic increases a number of problems arise, including network bottlenecks. At the same time, technologies such as SDN are gaining pace, with IDC expecting revenue to increase at a compound annual growth rate of 53.9%, reaching \$12.5 billion in 2020.

The spine-and-leaf architecture significantly reduces latency when it comes to accessing data located at different servers since it efficiently moves data across the non-blocking switch fabric formed by physical links in the spine-and-leaf network. This is critical for today's high bandwidth applications.

With the stage set for increased uptake of the spine-and-leaf network architecture, Corning is facilitating the creation of the necessary fully meshed cabling infrastructure for SDN, cost



reduction through standardised processes and architecture, significant space savings in the MDA and easy adaptation to future technologies.

By using EDGE Mesh Modules it is easy to upgrade a 4-way spine-and-leaf network fabric to a 16-way spine-and-leaf network fabric without a need to change already procured network switches. This allows customers to increase the number of hosts by 4-fold without sacrificing bandwidth and losing on their already made switch investment.

Major differentiators

EDGE Mesh Modules reduce the number of necessary patches through a miniaturised and integrated, pre-assembled system that follows a defined pattern. Only one single space-saving connector type is used in the entire optical permanent link, which reduces the usual space requirement by 75%.

Spine-and-leaf architectures typically run a 1 to 1 subscription ratio and this is replicated in the wiring of the EDGE Mesh Modules. This means that deployment is simplified.

The solution supports a wide range of connectivity options, from dedicated LC duplex based single ports, parallel optical multi-fibre applications to 400GBase and more.

At the infrastructure level, simplicity is ensured through one connector type (MPO/MTP) being used for the entire optical link. The Base-8 fibre design divides a Leaf port (switch-uplink from a server rack) into up to 4 different spine ports with only 2 patch cables per link. The traffic can be generated on a 4-way spine with 4 line cards per spine switch to 6912 host with only 3 hops.

Why nominee should win

- Corning's EDGE Mesh Modules reduce network complexity, increasing efficiency by using the port breakout application of parallel optical transceivers.



- **With parallel optical transceivers, a meshed network offers the lowest latency – an up-link port of a Leaf Switch can be connected to up to four different spine switches.**

- **Infrastructure savings: fewer patch panels and cabinets in the MDA, connectors in the link, and patch cables in the cabinet = less network infrastructure issues.**

- **The larger the meshed network becomes, the smaller the loss of bandwidth in case of failure of a spine switch, spine line card or a leaf port.**