Introducing the NG4access ODF Platform

The next-generation optical distribution frame that increases
density while reducing cost and installation time in the network

The increased demand for more bandwidth for an array of applications, particularly in mobile networking, is putting pressure on central offices (COs), head ends and data centers. This demand is driving higher fiber counts, making service providers walk a fine line between greater termination density for their optical distribution frames while maintaining easy accessibility for technicians.

In the past, the outside plant (OSP) to equipment fiber ratio was about two to one, or two OSP fiber terminations in the CO to every one equipment fiber termination. The focus for access and connections was primarily on the front of the optical distribution frame line-up. There was very little electronic equipment with optical interface – usually the last piece of equipment before the signal exited the CO. Increased bandwidth and the use of C/DWDM, ROADM and other technologies has led to more fiber optic connections in the office. The need for more fiber in COs, head ends and data centers today is putting more focus on the ability of the technician to bring cabling to the rear of the optical distribution frame (ODF), as well as provide a flexible solution that can adapt to different network strategies.

Addressing how to cable into the rear of these frames has become equally important as running the crossconnect jumper on the front. CommScope has been the leader in providing ODF equipment that has become the standard for managing optical fiber connectivity within the ODF. The company is now introducing its NG4access ODF platform that provides the same easy access, clear port identification, and industry-leading fiber management to both sides of the frame. But let's talk a bit about why this is important to you.

More fiber requires higher densities

Service providers are deploying ever-increasing amounts of fiber into their networks in general, but one of the largest increases is in the amount of fiber being deployed into the access network, from the OSP toward the subscriber (fiber-to-the-home, business, curb, etc.) Additional fiber is being used for wireless backhaul as mobile use steadily rises and more bandwidth-hungry applications are introduced for wireless devices, such as streaming video.

With more and more optical connections to contend with, the challenge becomes how to add optical density to the fiber frame while still maintaining proper accessibility, flexibility and manageability at the lowest possible cost.

Ultimately, all of these fiber terminations are destined for the rear of the ODF, presenting significant routing and management challenges for technicians since most fiber management systems were not designed for rear connector access or cable routing. Typically, the focus has been on the front connector access and crossconnect patchcord routing. Technicians are discovering that rear cable routing takes substantial installation time (cleaning and routing of connectors and fibers) and is simply much more difficult to achieve successfully without damaging connections or fibers through improper routing. In other words, it is adding a significant point of failure for problems resulting from damaged connection or fibers. Thus, while service providers are under great pressure to increase densities, they must also consider the significance of having the best possible accessibility while decreasing installation time and risk to the network.

Flexibility, modularity and footprint

Another trend related to more fiber in the COs and data centers is the push for improved modularity and flexibility using fewer parts. Again, the pressure is on to reduce installation time and expense in both new deployments and upgrades. Reducing installation times requires a solution that is engineered and configured for fast deployment, easy connectivity and with as less risk to the network as possible. But it also includes easy product selection, simplified ordering and shortened lead times. Simply put, service providers want one solution that will fit multiple application scenarios. The preference is one generic item that can serve multiple functions within the network.

Many solutions on the market today limit service provider choices according to application. For example, products may only be designed for use with certain connectors, singlemode or multimode, patchcords, IFCs (intra-facility cables), on-frame splicing or optical splitters. Ideally, service providers are seeking one base solution that is flexible enough to accommodate any installation and can be ordered by one part number – an off-the-shelf solution that makes engineering, configuration and turn-up fast and easy.

Achieving high density in a fiber panel or frame, from a pure physics standpoint, is not inherently difficult. A lot of adapters and connectors can be crammed into a very tight space. The challenge is, in two words, accessibility and identification. Can the technician find the correct port and connector to access, and can he access it without damaging adjacent fibers or without using a special tool?

From the technician's perspective, a hand should be the only tool required to install or remove a connector – and it should be completely obvious which port is the correct one to access. The process of counting horizontally and then vertically to locate the correct point must be replaced by clear designations that reduces human error or virtually eliminates it. The best management systems provide clearly marked port identifications, easy connector access, clear cable routing paths and, finally, modularity and functionality.

Introducing the NG4access ODF Platform

With many years of experience designing fiber management systems with innovative features that meet the requirements of service providers worldwide, CommScope has introduced its NG4access ODF platform. This product incorporates all the well-designed, easy-

to-manage characteristics that CommScope designed and developed throughout many years of listening to customers, and puts them into a single, modular, flexible product.

The building block for the NG4access ODF was a unique platform of a 12-fiber LC adapter pack. Due to their small size, packing many LC connectors side by side makes it difficult for a technician to access one connector without touching and risking damage to adjacent connectors. CommScope designed an LC pack that actually staggers every two connectors from front to back to provide visual separation and identification.

The adapter packs are fit into a chassis system for easy access to each group of 12 connectors. The chassis, in turn, fits into the frame system. Dimensionally speaking, the chassis is seven inches tall and 19 inches wide for rack mounting. The chassis can accommodate 576 LC terminations or 288 SC terminations – essentially doubling the largest termination counts currently available today. Easy access is provided by pulling out one of the access trays, which is comprised of 24 LC or 12 SC terminations. Each access tray has an articulating radius limiter that allows movement of the tray without pulling the fibers. No additional fiber is needed to open or close the tray. This is an important feature because gaining easy access versus having to move fibers has always been a balancing act for manufacturers in terms of fiber, connector accessibility and port density.

The access tray is universal and can hold LC, SC or pre-terminated IFC types of adapter packs. Thus, one chassis can adapt to any solution. Another unique feature is that in the same way the tray slides forward to the front of the chassis, it also slides toward the back of the chassis. To the technician, the look and feel of the front is the same as the look and feel of the back. Port identification is achieved by individually marking trays with letter designations. The twelve ports in each of the two adapter packs are labeled 1 through 12 and 13 through 24. So the NG4access ODF platform provides a solution with the same easy access and routing paths to both the front and rear sides of the chassis, providing equal simplicity and flexibility – a first for the industry.

Another benefit of the adapter packs that fit into the NG4access ODF is visibility. Whether accessing the front or rear of the chassis, technicians can actually see the connector on the other side. So whether it is an ultra-polish, angle-polish, singlemode or multimode connector, the technician can see which type of connector is required. By implementing a universal adapter pack, service providers can order one part number and have much more flexibility in their deployment strategy. This also enables future upgrade architectures that may require different types of connectors – allowing changes to be incorporated without needing to order an entirely new solution.

Cutting-edge design with fewer parts

The NG4access universal chassis was designed to add simplicity and modularity to the ODF. With that in mind, the chassis offers three primary ordering configurations– empty, LC or SC. First is the empty chassis into which adapter packs or other modules can be installed as needed. The chassis can also be ordered with ready-to-install LC adapter packs or SC adapter packs. There is also an optional splice chassis available. The on-frame splicing chassis can be added
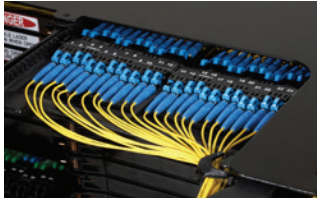
Empty Chassis

24 LC MPO Cabled Module

to the system without sacrificing any of the available LC or SC terminations. The splice chassis will hold up to 48 splice trays, which accommodates 72 fibers using ribbon splicing for a total of 3456 splices per frame.

The universal chassis is a 19-inch rack mount that fits easily into the NG4access frame. The same chassis can also be mounted at the top of an electronic equipment bay or cabinet as an intermediate distribution panel. Thus, the same chassis with the same part number can be used throughout the network, both at the intermediate distribution point at the top of the equipment bay or within the high-density NG4access ODF. A single chassis will yield 576 LC termination or 288 SC termination densities.

The NG4access ODF is a 30-inch wide, 24-inch deep frame, GR-449 Issue 3 and NEB Level 3 compliant. The system has been designed to interoperate with legacy NGF, NG3 or other GR-449-compliant high-density frames and can be added easily as the next frame in a frame line-up. Six chassis can be mounted into the frame, providing 3,456 LC terminations within one frame – an industry leading LC termination density. The same frame will accommodate 1,728 SC terminations, matching the NGF frame density, but enabling superior fiber and cable management from both a front and rear connector access perspective.

Increasing flexibility with modular packs

Two other elements that work with the NG4access chassis are MPO modules and cabled modules. The MPO module consists of two LC adapter packs or 24 front terminations, and two MPO adapters on the back side. The small module can be snapped into any of the open access tray positions on the chassis. This enables service providers to bring two 12-fiber MPO connections to the back as opposed to 24 individual fiber connections. Reducing 24 connections to just two connections greatly reduces both installation time and installation risk. It also provides a relatively small connector bundle to pull through an environment between floors and into different rooms or areas.

Since the MPO adds a small amount of optical loss despite its growing popularity in the access network, CommScope also created a cabled module. The cabled module takes the same MPO module concept, but uses a multi-fiber microcable in place of the MPO, which breaks out into individual fibers and connects into the adapter pack. Thus, it creates a module with 24 LC connections – or 2 cabled modules with 12 SC connectors each - on the front. The multi-fiber cable exiting the back side of the module would then route to a splice vault or secured in a tie panel or IFC cable configuration for outside plant applications. From the equipment bay, the cable would then be pulled to the fiber frame and snapped into any open tray position to provide 24 LC or 24 SC connections into the frame. In the process, individual connectors or fibers are untouched – only a rugged module and cable. This reduces installation time by 95 percent and greatly decreases installation risk.

New developments provide additional improvements

CommScope has several other innovations in development that will provide more modularity, flexibility and speed to the network. A modular pack device that contains optical splitters or WDMs will simplify the OSP portion of the network. As 40 and 100 Gbit/sec applications enter the realm of the data centers and COs, more MPO-to-MPO connections will be required for parallel optics. A universal MPO adapter pack is being designed for these applications.

From a cabling perspective, higher densities require more cable and more cable space. Most of today's applications are using 2mm, 1.7mm or 1.6 mm patchcords or jumpers. CommScope has developed and launched a 1.2mm patchcord cable that is providing huge benefits in terms of congestion and space. Following industry guidelines, 104 2mm cables can be placed in one square inch of space. A square inch of space will hold 140 1.7mm cables. The new 1.2mm cable will enable 280 cables per square inch of space – nearly three times as many cables compared with 2mm cable. The new 1.2mm cable offers the same tensile, compression and crush rating as larger 2.0mm and 3.0mm cables. Designed with reduced bend radius fiber technology, the 1.2mm cable is available with SC or LC connectors and is optimized for use in the NG4access ODF system.

A high-density frame that really works!

CommScope has not only developed the industry's best ODF design but, simply put, it also works better than anything the industry offers today. NG4access offers service providers with the perfect balance of accessibility and density that minimizes installation time and risk to reduce cost. This system replicates the exact time-tested benefits CommScope developed for the front of the ODF chassis and brings them to the back of the chassis – along with some new innovations.

With more fiber required in data centers and COs than ever before, achieving higher density is a huge challenge. But the bigger challenge is to provide those high densities in a fiber frame that provides the easiest possible access, error-free port identification and fiber management that incorporates modularity, flexibility and upgradeability to an ever-changing network.

Everyone communicates. It's the essence of the human experience. *How* we communicate is evolving. Technology is reshaping the way we live, learn and thrive. The epicenter of this transformation is the network—our passion. Our experts are rethinking the purpose, role and usage of networks to help our customers increase bandwidth, expand capacity, enhance efficiency, speed deployment and simplify migration. From remote cell sites to massive sports arenas, from busy airports to state-of-the-art data centers—we provide the essential expertise and vital infrastructure your business needs to succeed. The world's most advanced networks rely on CommScope connectivity.

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WP-110959-EN (02/17)