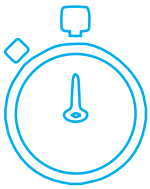
# High Speed Migration

## Bandwidth without boundaries

COMMSCOPE®

Every 60 seconds, the world downloads more than 38,000 hours of music on Spotify, streams nearly 70,000 hours of Netflix video, and sends 150 million emails. This isn't news, anymore—it's your day-to-day reality. And it's not changing any time soon.



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Source: "What happens in an internet minute"; Exelacom infographic; Feb. 2017

Exploding demand for bandwidth is pushing data center teams to rethink their network infrastructure as they look to support faster data speeds, lower latency requirements and future changes nobody can predict. Easier said than done.

Even as data centers transition to 25G, 40G, 50G and 100G, standards are being developed for 400G and beyond. Judging by the Ethernet roadmap, the path forward is neither clear nor straight. Driven by the emergence of many new technologies—including more efficient modulation, new transmission schemes and new fiber types—data center managers are faced with more choices than ever.

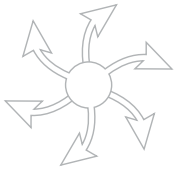
There are numerous migration paths from current network speeds to the higher speeds you'll need in the future. They all use a different mix of technologies, speeds and standards. Your infrastructure must be able to support all of them.

To do that, it must be:

- Agile and flexible
- High density and ultra-low loss
- Cloud friendly and scalable

The answer isn't just higher-speed fiber, more adaptable connectors or better patching and splicing solutions. It's all of them—engineered in concert and working together to deliver speed, agility and efficiency. At CommScope we simply call it the High Speed Migration platform. It embodies our vision for the future and includes the expertise to take you there.

# Your infrastructure must be:



## Agile and flexible

Integrate easily into your existing network environment while seamlessly adapting to new applications and unforeseen future changes

## High density and ultra-low loss

Keep the growing fiber network manageable without compromising the signal performance required to support higher lane speeds

## Cloud friendly and scalable

Support capacity planning and deployment as well as strategies to reduce cost and complexity in the network

# Real challenges—real solutions

CommScope's High Speed Migration platform is a unified, end-to-end channel approach to your infrastructure's ongoing development. The evolving portfolio consists of modular building blocks—high-speed fiber, MPO connectors, and ultra high-density fiber panels—infrastructure intelligence and network planning tools. Working together, they enable your infrastructure to adapt, evolve and scale—now and down the road.

Designed by experts who are immersed in your day-to-day reality, the High Speed Migration platform addresses the key challenges you face every day:

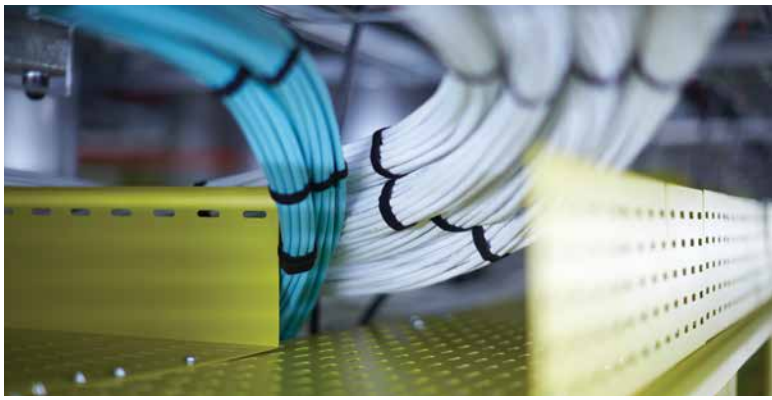
- How do you increase fiber and equipment port density while keeping it manageable?
- Which technologies provide the capabilities you need now—and an open path to the future?
- How can you guarantee support for increased speeds in the future without having to redesign the data center?
- How will your high-speed migration plan affect your time to market and operational and deployment costs?

More than innovative solutions, CommScope's High Speed Migration platform provides a long-term strategy for supporting higher speeds and emerging applications—without having to rip and replace.

## STAY AGILE, FLEXIBLE AND FUTURE READY

Agility is the ability of your data center infrastructure to support sudden and unexpected changes—such as a new row of cloud servers that need to be installed and up in days. Flexibility enables you to seamlessly integrate emerging applications and evolving technologies—open compute and private cloud. CommScope gives you both.

By enabling all major MPO fiber configurations, the High Speed Migration platform supports your existing and emerging applications while ensuring the optimal fiber configuration for each application. An extensive fiber portfolio—singlemode, OM4 and OM5 multimode—and the best available insertion loss provide guaranteed support for standard and emerging data center applications.



## KEEP DENSITY MANAGEABLE

Today's network architectures are shifting to spine-leaf, fabric topologies. The any-to-any connectivity requires higher equipment port density and equally dense fiber connectivity. CommScope's High Speed Migration platform keeps your growing fiber density under control.

Our high-density (HD), ultra high-density (UD) and enhanced high-density (EHD) fiber panels are uniquely designed to provide open access to individual fibers. At the same time, an innovative fiber containment and routing design protects every connection and keeps the fiber infrastructure accessible and manageable. The result? Easier and faster moves, adds and changes; accelerated mean time to repair; simplified installation and lower costs.

## ENABLE HIGHER SPEEDS WITH ULTRA-LOW LOSS

Everything in the optical path contributes to signal loss. As application speeds and link spans increase, loss budgets shrink. Supporting higher speeds over longer distances requires an end-to-end channel approach featuring ultra-low-loss (ULL) components. The High Speed Migration platform delivers.

For high-speed links (10G and above), our ULL solutions support all existing and emerging applications, including challenging new technologies like PAM4 modulation. Our advanced OM5 Wideband multimode fiber opens the door to shortwave division multiplexing (SWDM). Now you can quadruple your OM4 capacity while maintaining the familiar duplex multimode architecture.

CommScope's High Speed Migration platform includes TeraSPEED® singlemode, LazrSPEED® 550 multimode and LazrSPEED 550 Wideband multimode fibers. They support evolving 100G and 400G applications while enabling flexible ULL preterminated components. You get full-rated link distances while maintaining your existing structured cabling topologies for better operational agility and availability.

### REDUCE COST THROUGHOUT

CommScope's High Speed Migration platform is uniquely designed and engineered to help minimize your total cost of ownership and drive more value through your data center.

HD, UD and EHD fiber panels help reduce the risk associated with change while keeping operational cost as low as possible. Preterminated connectivity and plug-and-play installation help you lower deployment time and cost and accelerate ROI.

CommScope's ULL fiber solutions provide the most extensive guaranteed application support over longer spans and more connections than any other system on the market. So you can take advantage of emerging multimode and singlemode duplex fiber applications to dramatically reduce your fiber counts and increase capacity.

# Modular, scalable components


| | Product | Description |
|---|---|---|
| 1 | SYSTIMAX UD panels | Ultra high-density fiber panel supports 72 duplex LC or 48 MPO per RU, with split-tray design for optimal cable management. Supports G2 modules and imVision AIM. |
| 2 | SYSTIMAX HD panels | High-density panel supports up to 48 duplex LC ports or 32 MPO per RU with split-tray design. Supports G2 modules and imVision AIM.) |
| 3 | SYSTIMAX EHD panels | Enhanced high-density panel supports up to 72 duplex LC ports or 72 MPO per RU. Sliding-tray design provides open access, front and rear, to all fiber connections. Supports splice cassette for better deployment flexibility. (Does not support AIM) |
| 4 | ULL modules and adapter packs | UD and HD G2 modules; EHD modules, adapters and splice cassettes support OM4 and OM5 multimode for MPO-8, MPO-12 and MPO-24 and singlemode for MPO-8 and MPO-12 — all with ultra low-loss performance. |
| 5 | ULL Preterminated cable assemblies | Patches fiber ports and equipment ports as required — all with ultra low-loss performance. |
| 6 | ULL fiber trunks | Provides high-density factory-terminated and tested fiber cabling between data center equipment areas. Available in singlemode and OM4, OM5 multimode—all with ultra low-loss performance. |
| 7 | imVision® AIM intelligence | UD and HD panels with SYSTIMAX iPATCH® G2 modules enable automated infrastructure management (AIM) for real-time documentation, monitoring and management of the entire high-density physical layer. |

# A growing portfolio of modular, scalable solutions

At CommScope, it's our job to know what's next. Our ever-evolving High Speed Migration platform reflects our vigilance and vision.

As a member of the global standards bodies focused on network infrastructure, CommScope has an inside track on the trends and technology shaping the industry. As standards change, the platform will adapt and grow—with ready support for the next evolution of your data center and the applications it serves.

## HIGH-DENSITY (HD), ULTRA HIGH-DENSITY (UD) AND ENHANCED HIGH-DENSITY (EHD) FIBER PANELS

High Speed Migration panels feature innovative sliding-tray (EHD) and sliding split-tray designs (UD and HD) that ensure open access to all fibers and connections. Make changes to individual fibers and connections while ensuring the existing live circuits are not disturbed. A more reliable fiber routing system ensures all cables remain ordered, visible and accessible as they exit the front and rear of the panel.

HD panels offer 48 duplex LC or 32 MPO ports per rack unit (RU) while the UD panels feature 72 duplex LC or 48 MPO ports per RU. Designed to support your core network interconnections, our EHD panels provide 72 duplex LCs or 72 MPO ports.

The HD and UD panels support singlemode, OM4 and OM5 multimode fiber and utilize the SYSTIMAX G2 fiber module and adapter packs to enable deployment across multiple platforms. These HD and UD panels and modules are also intelligence-enabled, ready to support CommScope's imVision automated infrastructure management solution. The EHD panels use our highest density EHD modules, adapter packs and splice cassette for high-density design flexibility and also support singlemode, OM4 and OM5 multimode fiber.

## MPO CONNECTIVITY OPTIONS

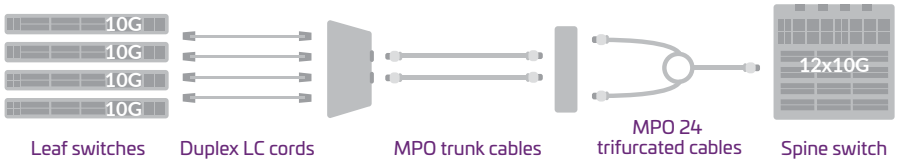
The High Speed Migration platform is designed to support a wide variety of MPO connectivity for singlemode and multimode, low- and ultra low-loss systems. For high-density, ultra low-loss trunking, our 24-fiber MPO connectors ensure lower "first cost" deployment for multimode networks. MPO connectivity options also include 8-fiber MPO configurations, which support parallel optic configurations such as 4x10, 4x25 and 4x50. So you have more flexible and scalable options for fabric links and breakout server attachments. CommScope's 12-fiber MPO connectivity enables seamless expansion of your legacy infrastructure, helping extend and preserve your existing 12-fiber network.

### Manage your migration with the real-time intelligence of imVision®

As network complexity and fiber density increase, so do the challenges of documenting and tracking the connected environment. An automated infrastructure management (AIM) solution like SYSTIMAX imVision from CommScope monitors your growing physical layer for maximum performance and minimal risk.

- Accurately document end-to-end connectivity—including point-to-multipoint connections
- Automatically monitor and record all physical layer changes as they occur
- Receive alerts when any unplanned or unauthorized changes are made
- Identify unused IT assets and cabling for reuse

Migrating to faster speeds adds more components, cables and connections—all of which must be monitored and managed. Manually documenting the connected environment using spreadsheets is virtually impossible. SYSTIMAX imVision automatically tracks every connection, providing real-time information for location, status, connectivity path and more. So you can handle moves/add/changes more easily, accelerate mean time to repair and optimize your entire infrastructure. Many of the components in CommScope's High Speed Migration platform are available with optional imVision intelligence.




An AIM solution is ideal for managing the increasing complexity of MPO and duplex links and channels.


## TERASPEED® SINGLEMODE AND LAZRSPEED® OM4 AND OM5 WIDEBAND MULTIMODE FIBER

In addition to featuring TeraSPEED singlemode and LazrSPEED OM4 multimode fiber, CommScope is the first to offer OM5 Wideband multimode, which opens the door to a number of emerging applications, such as short wavelength division multiplexing (SWDM). Pioneered by CommScope, OM5 Wideband enables simultaneous transmission of four wavelengths on the same fiber. So you can quadruple your capacity and take advantage of low-power, low-cost VCSEL technology to dramatically increase the value of your multimode fiber infrastructure.

## ULTRA LOW-LOSS CONNECTIVITY

CommScope's ultra low-loss (ULL) fiber solutions consist of high-bandwidth fiber and factory-preterminated ULL connectivity. The result is excellent loss performance. Used throughout the channel, our ULL solutions enable longer link spans and more complex topologies while supporting the physical layer design you need to achieve guaranteed operational availability. For singlemode applications including hyperscale deployments, CommScope's G.657.A2 fibers offer the lowest bend losses—for macro- as well as micro-bending—while still being fully compatible with G.652.D fibers. ULL apparatus provide extended reach for emerging PAM4 DR and DR4 100/400G applications.

## NETWORK DESIGN TOOLS

In addition to our portfolio of fiber and connectivity solutions, CommScope's High Speed Migration platform features unique design tools to help speed and simplify the design and planning for your next upgrade.

CommScope's extensive Application Specifications define the channel topology limits specific to our SYSTIMAX cabling solutions for a wide range of design options. It covers standards-based, multisource agreements (MSAs) and proprietary specifications for applications you may be running as well as those you may need to support in the future.

The unique Link Loss Calculator is a truly innovative tool that makes it fast and easy to determine the attenuation requirements for a proposed cabling channel while simultaneously verifying which applications the channel will support.

Not only do these tools allow rapid design exploration, they form the basis of CommScope's unique SYSTIMAX Application Assurance program. Application Assurance guarantees that the SYSTIMAX channel components will operate in accordance with the Performance Specifications. Just one more way CommScope stands with you and by you. See CommScope Network Infrastructure System 25-year Extended Product Warranty and Application Assurance for details and conditions.

As applications continue to evolve and the need for bandwidth grows, will your network infrastructure be able to flex, adapt and scale to meet the needs of advancing standards, technologies and hardware? With CommScope by your side and our High Speed Migration platform at your disposal, the answer is a resounding **YES**.

Learn more at commscope.com.

# More than solutions, you have a strategy

There are many migration paths to higher speeds and data center capacity. You need a robust infrastructure: agile enough to respond to unexpected circumstances and flexible enough to scale and integrate tomorrow's game-changing technologies—a completely modular connectivity platform that keeps your network fast, future ready and cost-efficient.

More than this, you need a partner—one who understands your business needs and can provide insight to future data center ecosystems and technology trends.

With a long history of industry firsts, CommScope is driving the evolution of fiber connectivity. Our long-standing tradition of innovation, expertise and leadership is recognized globally, and is additionally built on our relationships with enterprise, hyperscale, multitenant and service provider data center customers.

CommScope (NASDAQ: COMM) helps design, build and manage wired and wireless networks around the world. As a communications infrastructure leader, we shape the always-on networks of tomorrow. For more than 40 years, our global team of greater than 20,000 employees, innovators and technologists have empowered customers in all regions of the world to anticipate what's next and push the boundaries of what's possible. Discover more at commscope.com.

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