Broadband networks case studies

Innovating the future of FTTx and HFC networks

COMMSCOPE®

" CommScope knocked the ball out of the park. Our situation is unique and they took the time to listen and learn about us. That was crucial to the success of this project."

A customer's network planner

Broadband network case studies

A lot of solution providers in the telecom industry focus on a portion of what is needed for a successful broadband network and HFC rollout, but few can offer a true end-to-end solution. At CommScope we are committed to providing our customers the support they need to be successful. Our solutions are built on 40 years' experience solving customer needs from all over the globe and working side-by-side on their broadband rollouts to ensure maximum efficiency and performance. Our customers rely on us to be a trusted partner, working with them to create the best broadband and HFC network solution.

For me, this eBook is a small list of the many ways we have helped solve customer's challenges with their broadband rollouts illustrating how we helped standardize one cable operator's network after several mergers, or trained fiber optic technicians on an ambitious broadband rollout. Overcoming the challenges of yesterday has given us the knowledge and experience to tackle what lies ahead. Everything we do is to help our customers—our customers matter.

CommScope's culture of innovation and problem-solving is how our world-class engineers bring powerful ideas to market. We couldn't do any of this without customers' input and requests. Their networks are constantly changing, and they can trust CommScope to know what's next.

These pages demonstrate just that. We can be part of building every aspect of a network with end-to-end solutions from the central office to inside customer premises. We listen to customers' challenges and can quickly adapt. Our team can train people who have never built a network and partner with the customers moving from a coaxial or copper network to a full broadband network. Our solutions are built to withstand rugged environments in any part of the world. This is what we do.

CommScope is proud to help build, design and deploy high-quality networks and develop long-lasting relationships. This eBook is dedicated to our esteemed customers who made these success stories possible. Thank you for showing the world what we can do together.

Erik Gronvall
VP, Strategy and
Market Development
at CommScope

Case Study

01 - Innovation on a paper napkin

Thinking and designing outside the box

Located in the APAC Region, this service provider is deploying FTTH in urban and suburban areas across the country. Reusing manholes, conduits, and other aspects of the existing telephony infrastructure would help speed up the deployment and keep costs under control.

The challenge: construction costs and delays

It started with a solid plan—upgrade key parts of the underground infrastructure to make room for the new fiber equipment. As construction work began, it became apparent that the aging infrastructure was in worse condition than expected. Prolonged and unbudgeted civil works would be required.

So, back to the drawing board

Was it possible to design a new, significantly smaller fiber terminal that fit into the existing underground space in order to avoid construction?

Was it possible to design a new, significantly smaller fiber terminal that fit into the existing hand holes in order to avoid construction?

When space is at a premium

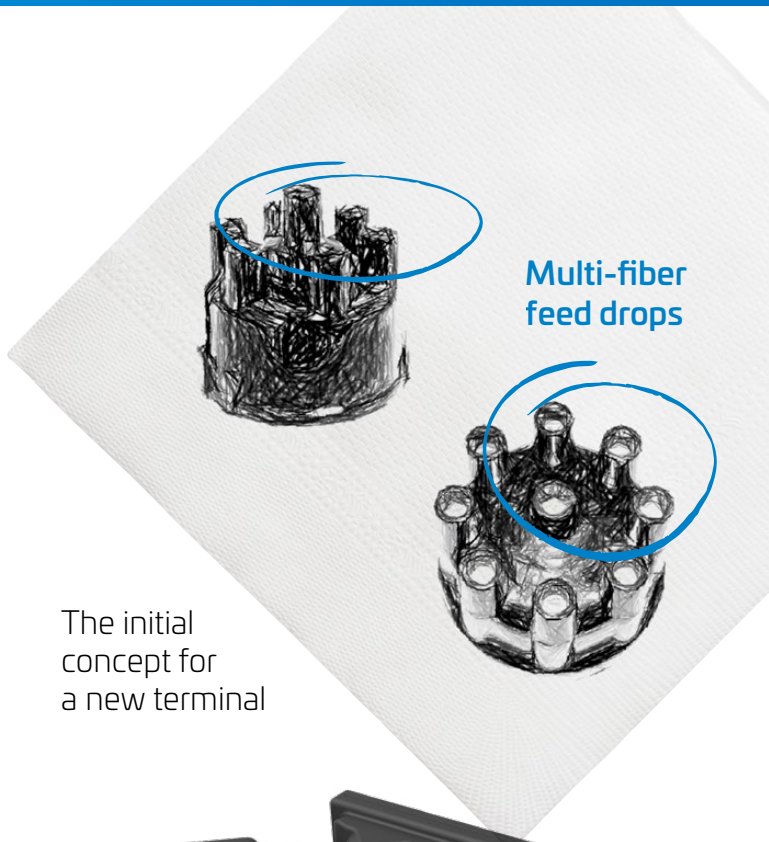
"You've got to roll with the punches—sometimes you just have to work with what you've got," said a project engineer. That meant designing a fiber-optic terminal with the same functionality as the MST, the CommScope product originally specified, but one with a much smaller footprint. Given that the form factor of the MST was already optimized to be compact, this was not a simple task.

Brainstorming ... in a restaurant

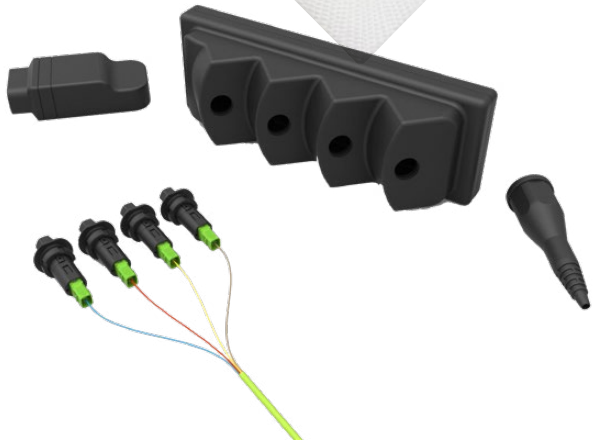
"Our first idea came to us at a dinner winding down after work. We literally sketched it on the back of a paper napkin," said a CommScope R&D engineer. "It wasn't the design we ended up with, but there were a couple of key ideas in there that made it into the final product."

Tear it down, then build it back up

The R&D team then took a deconstructionist process in stripping the fiber terminal down to its core functional elements, then regrouping those elements into different configurations for different designs. Ultimately, the final design resulted from this approach.



The initial concept for a new terminal



Deconstructing the functional elements

The final design

The space/footprint constraint was solved by extending the connectors outside the terminal, literally an out-of-the-box solution. The terminal became less compact but far more flexible, and hence easier to fit into congested spaces. The cables were staggered in length, thus allowing installers easier access to perform installation and maintenance work.

It took six months from the first design on a paper napkin to a working prototype used for initial testing by the service provider.

The final design:
Flexible service terminal

Plan for the right product...but be prepared to adapt when the situation changes.

Summary

With this new product, specifically designed for space-constrained environments, the service provider was able to avoid tens of millions of dollars in unforeseen construction costs and months of delay in the network deployment.

The choice of products can sometimes have a large impact on overall deployment costs and schedules.

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TENIO splice closure >>

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Case Study

02 - Broadband for everyone: A rural case study

Broadband for everyone

The ever-increasing use of connected devices raises consumer demand for speed and bandwidth. These expectations for seamless connections coupled with the speed of data, doesn't stop at the city limits. Service providers and MSOs are quickly working to extend broadband into the rural and exurban areas.

The Challenge: Extending the reach of broadband

Bringing broadband service to rural and underserved exurban areas can pose unique challenges to providers. Deployments must cover great distances to reach just a few homes. Rural areas have higher costs per home passed, and require high subscriber take rates to make fiber deployments economically possible. Providers must invest heavily in equipment

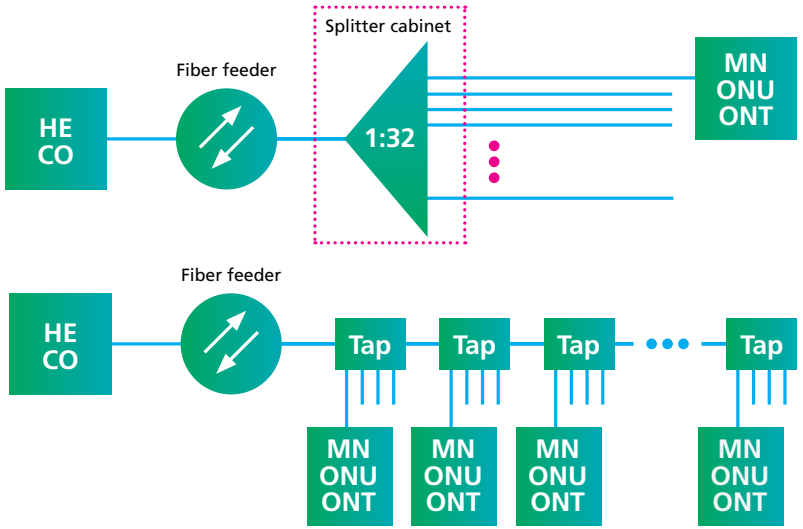
and labor, so solutions that can reduce expenditures in either of those key categories can make the difference between economic success or failure.

When extending to rural installations, network architecture is a crucial decision for providers. These deployments can cover great distances of sparsely-populated terrain, with just three or four homes per kilometer. Land can be mountainous, forested, or desert, with little existing infrastructure. Providers need solutions with design simplicity, to keep labor and equipment costs as low as possible.

One option, employed by service provider, to create or expand rural fiber-to-the-home (FTTH) networks economically is using a TAP architecture.

Fiber-optic TAPs—a nontraditional approach

In a TAP FTTH network architecture, a fiber cable is deployed throughout a service area, and fiber-optic TAPs (Terminal Access Points) divert optical signals to subscribers. It's a simple process. The cable is opened and one of the fibers inside is carefully cut. A fiber-optic TAP is spliced into the line, which siphons off a portion of the signal for a subscriber. The TAP allows the signal to continue down the line to the next home or business, where the process is repeated. Multiple TAPs can be spliced into the line until the signal is exhausted—usually at 32 subscribers. At this point another fiber in the cable is cut, and the process continues.



A traditional, centralized, FTTH network architecture (top) compared to a distributed TAP network architecture (below)

TAP ARCHITECTURE

Key benefits:

- Equipment savings
- Labor savings
- More efficient to deploy
- Easier to maintain
- Easy future expansion

A TAP network design is quite different from the design of a traditional "centralized" FTTH network, which typically uses splitters installed in a cabinet configuration to distribute data to subscribers. In this splitter-based architecture, a fiber-optic feeder line runs from the central office or head-end location to a cabinet in the street or service area. The feeder line terminates on an optical splitter in the cabinet, which distributes the signal to subscribers with additional fibers. This hub-and-spoke design gives providers great flexibility, as the cabinets allow easy management of both fiber connections and central office equipment, and can also be used in proximity to remote central office equipment.

Faster installations at lower cost with TAP network architecture.

- Fewer fiber cables required
- Design simplicity—one type of small fiber count cable can be used
- Less splicing required, saving skilled labor
- No need for complicated splice maps
- Large equipment savings—distribution cabinets and splitters generally not needed

Equipment and cable savings

The biggest difference between TAP network and splitter-based architectures is in their respective cabling requirements. For a deployment serving 256 subscribers, the minimum number of fibers required in the splitter-based architecture is 256. These 256 fibers run in several smaller cables from the equipment cabinet. The cabinet is necessary to house the eight 1x32 splitter components, which route optical signals to subscribers, as well as permit fiber access for ongoing maintenance. For many rural deployments, splitter-based architecture is considerably more expensive, as it requires the use of much more fiber cable and distribution equipment.

In comparison, for a 256-subscriber deployment, TAP architecture needs a minimum of eight fibers. Two four-fiber cables are run directly into the served area, without the need for a cabinet to house splitters and connections. Cable savings would depend upon the length of the runs to the actual drop points; but, since four-fiber cable costs much less than 72-fiber cable, savings could easily run to thousands of dollars. With TAP architecture, providers

have seen large reductions in the number of optical fibers used in a deployment—some as large as 87 percent. TAP architecture also avoids the need for an equipment cabinet, splitters, mounting pad, and cabinet installation labor.

Planning for future expansion

Some operators believe that, compared to splitter architecture, TAP architecture networks are difficult to expand. While it's true, TAP systems are often designed with minimal fiber us to save as much up-front cost as possible. Designers can use a 1:2 split at launch to increase optic use efficiency; if expansion is required later, this 1:2 split can be removed to add capacity, and additional fiber-optic TAPs added to change to a higher port count. And, in another expansion strategy, many operators purchase dark fibers along with the initial four-fiber cables, as the economics are best with a full buffer tube of 12 fibers. The cable size doesn't change, and the additional dark fibers provide the highest utility of all solutions, with each fiber good for another 32 homes.

Summary

While there are both financial and topographical challenges to deploying broadband in rural areas, using TAP network architecture is optimal choice to help overcome them. A major benefit of this design is the significant reduction in fiber required to serve a rural area. With the long distances typically involved in rural FTTH deployments, this reduction in fiber count can dramatically reduce up-front network costs and allow providers to serve areas where deploying a traditional fiber network would have been cost-prohibitive.

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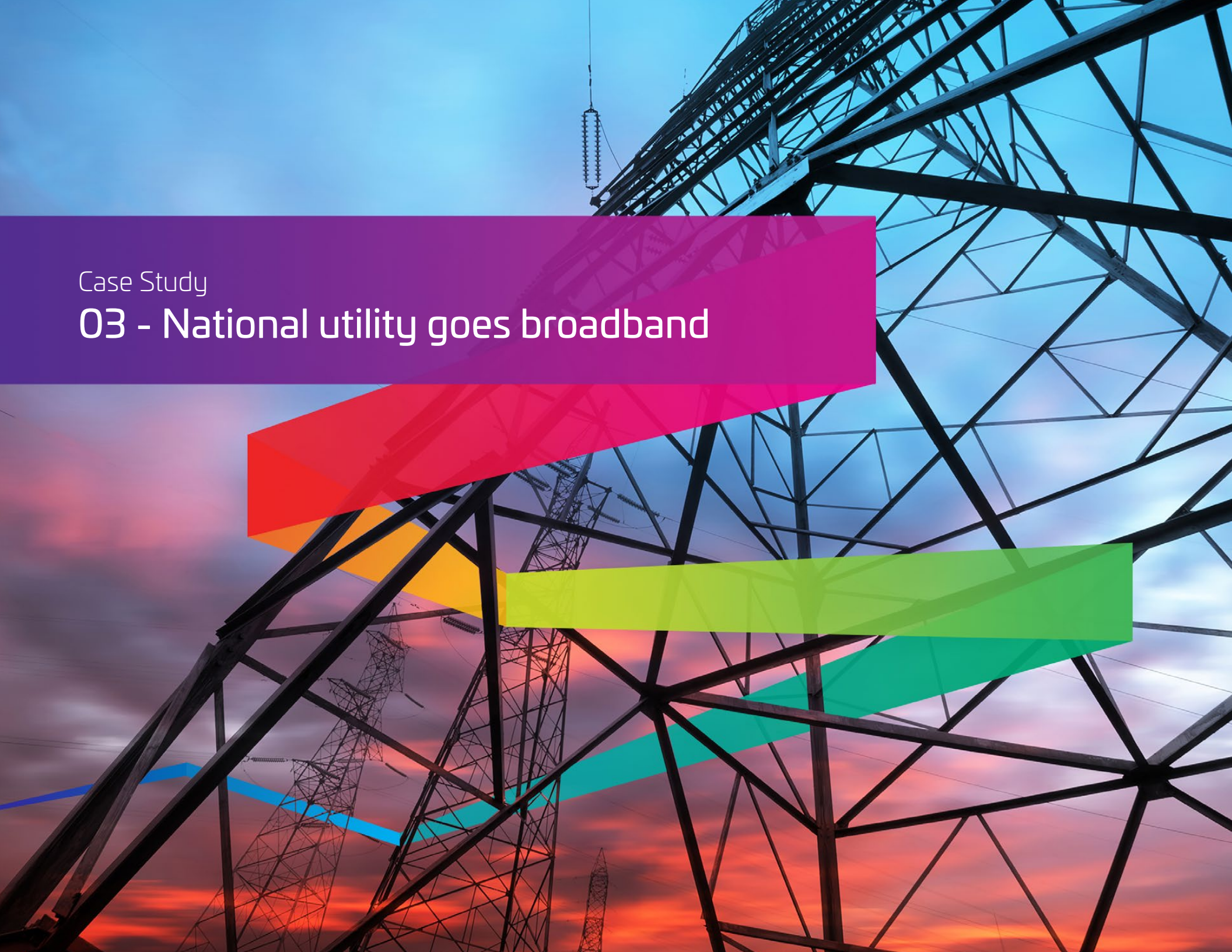


Case Study

03 - National utility goes broadband

Internet as a utility

Recognizing that the digital economy would be a key pillar of the country's future growth and competitiveness on the world stage, this European electrical utility decided to bring high-speed internet access to homes and businesses across the country. The utility would build and own an open-access FTTH infrastructure and lease it to partners—who, in turn, would offer retail internet and other services to subscribers.

The challenge: Cost overruns

The first phase of deployment covered approximately half a million premises. The utility had an extensive electrical grid infrastructure, rights of way, experience in outside plant deployments, and even a fiber backbone supporting leased fiber services. However, FTTH was a new architecture for them. As deployment started, the utility began to see cost spikes. How did they deal with the costs and bring the project back on track?

How did they deal with the costs and bring the project back on track?

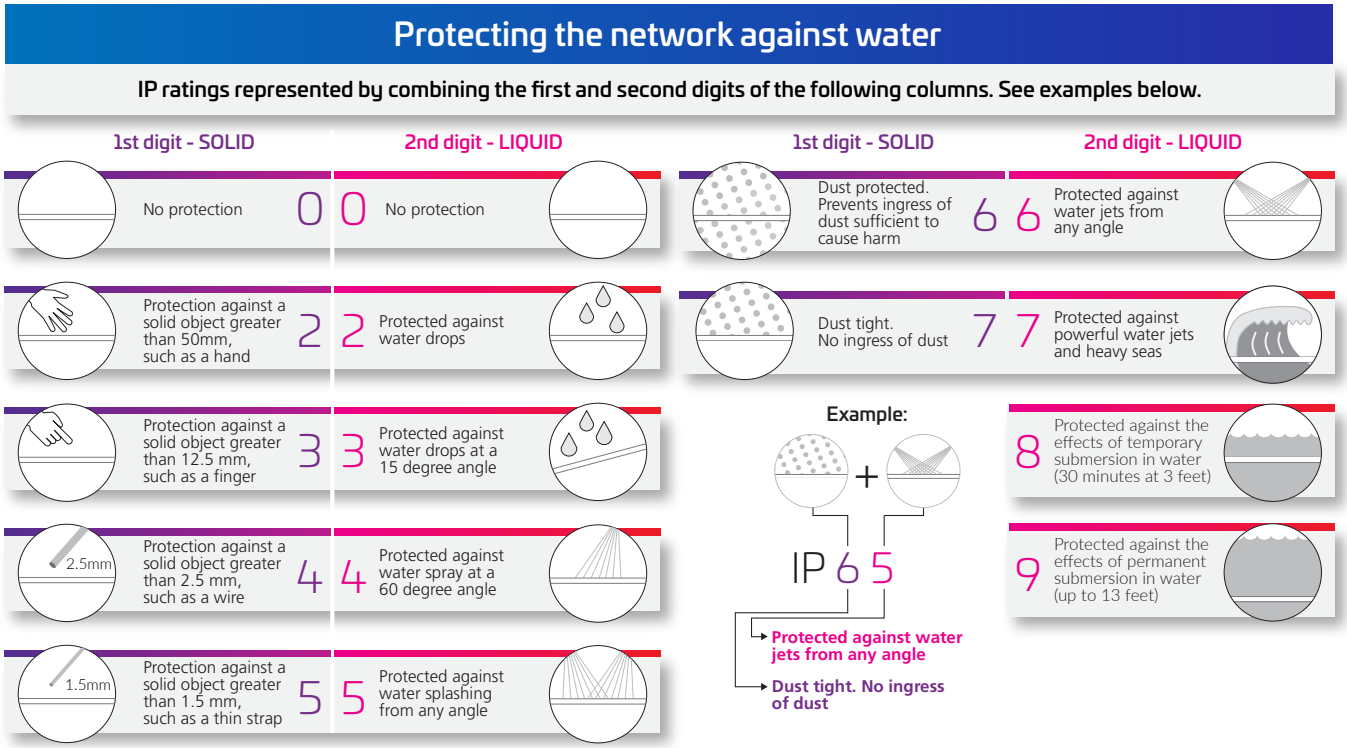
Redesigning the network

"There are some unique challenges in building FTTH on top of a live electrical distribution system," says the CommScope engineer. "The utility had to minimize service disruption. Installer safety was of paramount concern when working in close proximity to high-voltage equipment. And, on top of all this, the grid maps were sometimes out of date." The unexpected scope of these issues pushed installation costs well above budgetary estimates.

Rainy days

Another factor was the wet weather. The amount of rainfall and the propensity for flooding meant the equipment had to be well sealed to provide water-resistant or waterproof protection.

"In situations like these, there is rarely a one-size-fits-all approach," said the CommScope account manager. "What was needed was a set of economical solutions that fit well with their existing grid infrastructure. The initial network was designed for maximum flexibility and growth… and this comes at a price. We conducted detailed field surveys and, once armed with the data, we could then optimize the network architecture and product selection."



Reducing installation costs

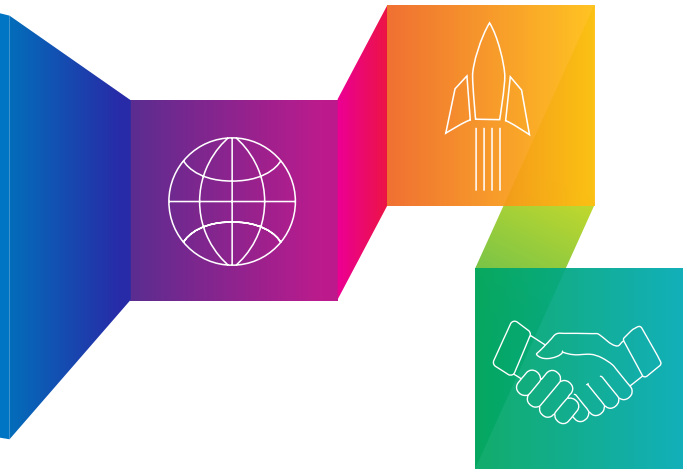
"We reduced the number of the smaller cabinets by building a centralized topology that places splitters 1:32 in a central location. Initially these hubs with splitters were cabinets but, due to the civil works and installation costs involved, this was not an ideal solution. An alternative way to meet the goals of the network at lower cost was moving splitters into splice closures with cold sealings, easy access and good flexibility for growth, reducing labor costs significantly, reducing labor costs significantly by reducing training and installation time. Being environmentally hardened, preconnectorized and not requiring open access, even on day one, they also provide excellent protection against the elements."

When unforeseen costs spiral out of control, a trusted partner can get you back on track.

Summary

A network redesign, an optimized set of products, and a focus on labor savings helped put the project back on budget. The utility's network planner said, "CommScope showed they were true partners. We had worked with them on our leased fiber network in the past, so it was natural to bring them onboard for FTTH. They were quick and responsive, and their global experience provided a welcome perspective."

"They were quick and responsive, and their global experience provided a welcome perspective."



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FOSC (Fiber optic splice closure) >>

TENIO splice closure >>

Hardened connectivity >>

Mini-OTE terminal >>

Premises box >>

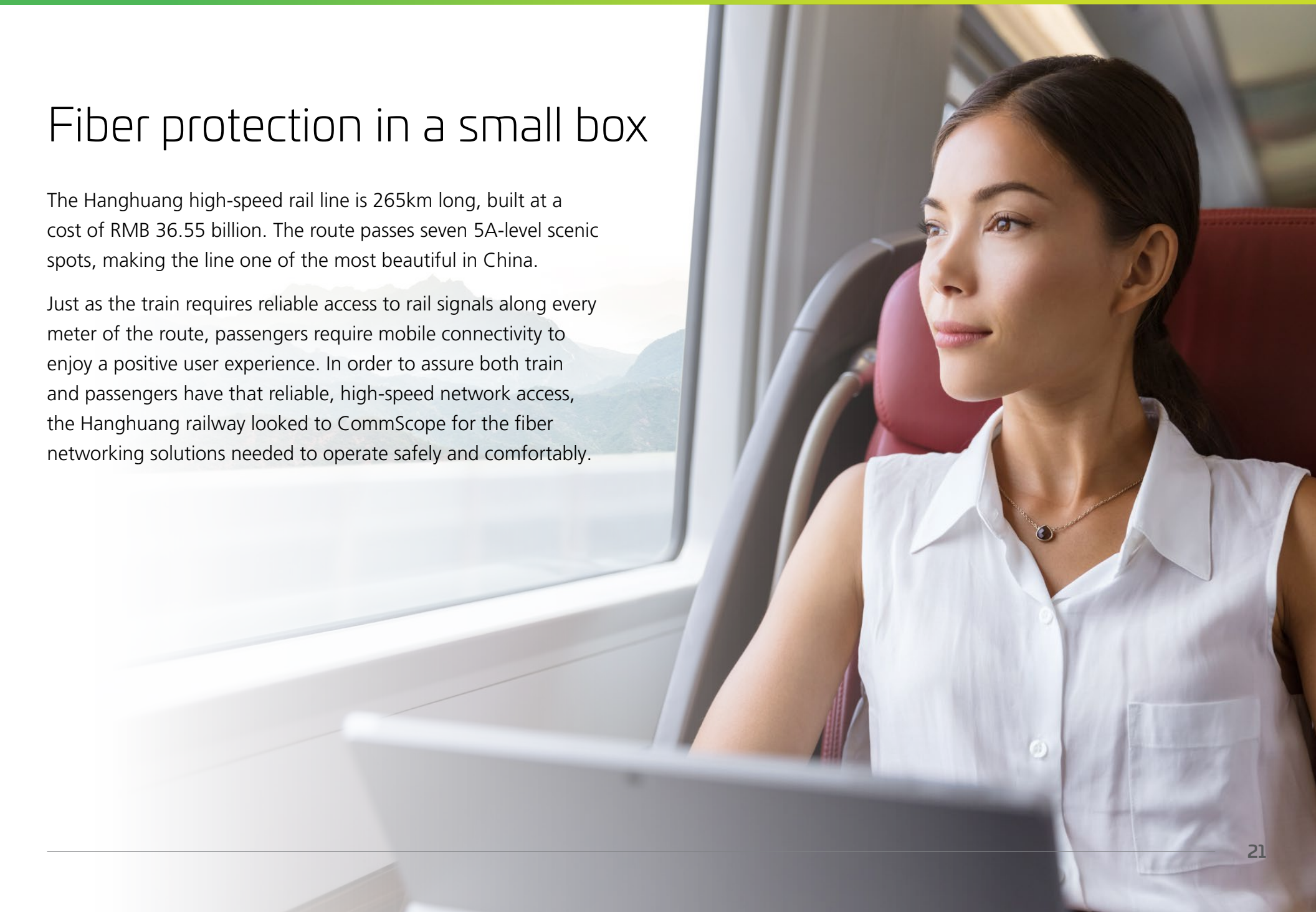
Case Study

04 - Fiber protection in a small box

Fiber protection in a small box

The Hanghuang high-speed rail line is 265km long, built at a cost of RMB 36.55 billion. The route passes seven 5A-level scenic spots, making the line one of the most beautiful in China.

Just as the train requires reliable access to rail signals along every meter of the route, passengers require mobile connectivity to enjoy a positive user experience. In order to assure both train and passengers have that reliable, high-speed network access, the Hanghuang railway looked to CommScope for the fiber networking solutions needed to operate safely and comfortably.



The customer's challenge

When passengers pass through the mountains and enjoy the beautiful scenery outside their windows, they likely never consider the difficulty of high-speed rail construction, nor the complicated geological conditions that make the Hanghuang line particularly challenging. Because the route passes through many unfavorable geological areas—water-rich fracture areas and extremely high ground stress zones, multiple tunnels and bridges—it is particularly important to ensure stable and reliable cable splice protection when laying optical fiber to ensure the signal connection of optical fiber repeaters along the railway meet long-term development needs.

Unlike the optical fiber network architecture and construction environment of traditional telecom operators, this application requires independent cable slots, signal control cables and communication cables along the route. However, due to the limited internal space of cable slots, optical fibers cannot be rolled up at the splice point (as it would be in a typical urban deployment) and the cap type cable splice closures cannot be used. Instead, a linear cable splice box must be used.

In addition to the technical challenges, planning challenges also came into play. The complexity of the terrain along the railway, the construction's initial, early-stage difficulties and the tight deadline for its completion all meant that the construction team needed to complete cable laying and welding for the three participating wireless operators quickly and efficiently, in order to carry out the joint debugging test on schedule. This required the ability to quickly and securely manage fiber splicing along the line.

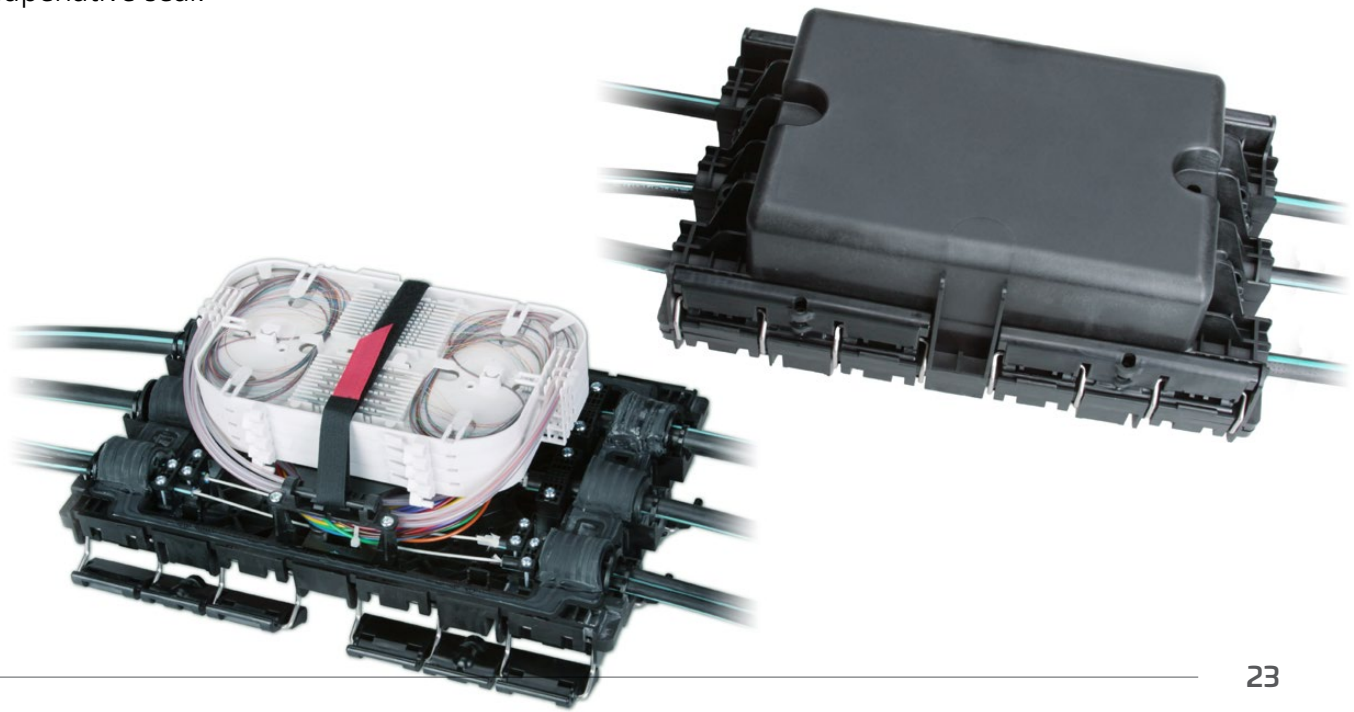
Due to the high cost and difficulty of maintenance, the solution had to provide long-term stability and reliability in operation—any problems would have severe safety implications for train operation as well as passenger experiences. Therefore, the splice closure solution had to work correctly from the outset and provide many years of reliable service.

Traditional horseshoe gel closures were complex and difficult to install. The gel is hard and require bolts to seal the closure, which takes a great deal of time. Furthermore, any maintenance of the closures required the removal and replacement of sealing gaskets, which introduced a greater risk of water infiltration and network degradation.

The CommScope solution

The communications operator serving the Hanghuang high-speed rail chose CommScope's linear gel-sealed splice closures for this critical external network. The linear gel-sealed splice closure uses a supple sealing gel that can be formed to shape with minimal pressure and retain memory of that shape. When sealed, the gel distributes force evenly and fills the entire chamber space for a superlative seal.

These advantages effectively ensure the long-term stability of the optical fiber, fully satisfying the unique and demanding stability requirements of the locomotive signal transmission.



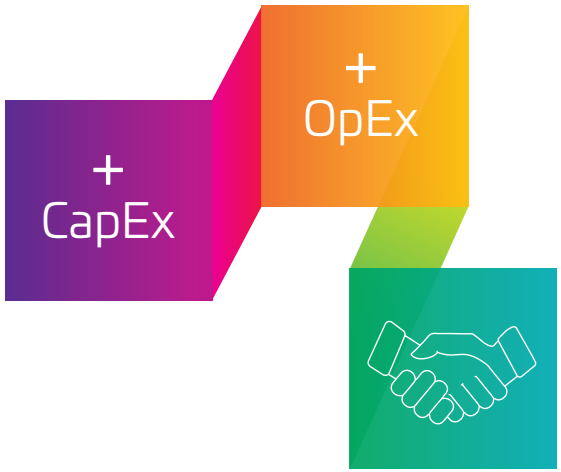
The results

CommScope's linear gel-sealed splice closures significantly shortened installation time and improved the efficiency of regular maintenance processes.

The customer's analysis revealed that installation time was reduced by 15 percent, and maintenance that involved opening and resealing the closures was reduced by an amazing 30 percent.

While comprising only a small percentage of overall construction costs, CommScope's linear gel-sealed splice closures provided an extremely valuable level of reliability in fiber nodes carrying the rail signal control as well as passenger connectivity.

Due to its compact size, quality construction, favorable CapEx and OpEx characteristics, ease of installation and simplicity of maintenance, CommScope's solution proved to be an ideal match for the Hanghuang high-speed rail line—and indeed any rail transit application.



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Case Study

05 - Fiber optimized for the future

End-to-end solutions

We offer a comprehensive fiber portfolio, spanning the customer premises, MDU, fiber access network, through to central office and head-end equipment.

Fast forward to the future

This telecom operator provides wired and wireless network and infrastructure services. Its investment in fiber optics and a high-speed, high-bandwidth, full-fiber network led to the need for a comprehensive fiber management solution.

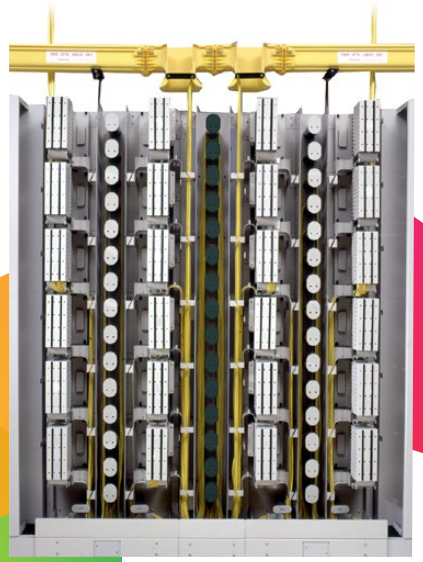
Space race

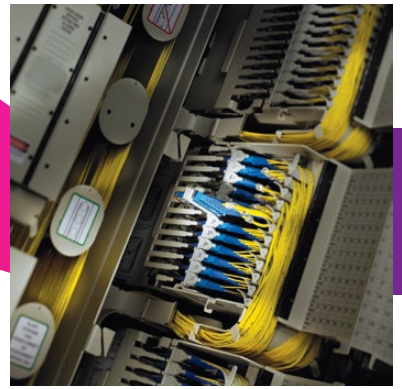
Over time, the operator purchased off-the-shelf cable management products that couldn't keep up with future growth. Limited access space and lack of cable management features affected the network's flexibility and reliability. An increasing number of optical fiber ports and lack of optical cable management resulted in cluttered cables and low usage rates for device ports.

Clean and lean

CommScope's Next Generation Frame solution was the ideal choice to upgrade this infrastructure. Its modular design features a unified rack structure that has abundant trough space, minimizing fiber pileup and congestion. Accessing cables and connectors is easy with this horizontal platform. The frame also makes it easy for the operator to move or add equipment.

How would this telecom operator meet the demands of a full fiber network?





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Seeing success

The operator faced a tight deadline to find a reliable and secure solution due to the fast-approaching BRICS Summit, an event that required stable, secure communication. A CommScope partner quickly surveyed 15 central equipment rooms where the frame solution would be installed, identifying exact connector lengths for each site. CommScope helped fulfill the orders, meeting the operator's schedule.

The operator chose a 96-core module with an option to upgrade to 144-core, depending on future needs. The equipment rack can expand up to 40 percent using CommScope's Next Generation Frame. Components such as splitters, couplers and wavelength division multiplexers are also available to help the operator enhance the usage rate for fiber resources.

Small changes in your network can make a big difference your in efficiency.

Challenges of an evolving network

- Complex fiber migration & management
- Rising bandwidth demands
- Increasing pressure to ensure reliability
- Cost containment throughout the network

Reliability on demand

Telecom operators need systems and equipment they can count on for optimal performance, uptime and growth flexibility. CommScope's plug-and-play solutions easily accommodate frequent adds and changes to equipment while promoting speed and efficiency.

The right fiber solutions are scalable and grow with you.

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Case Study

06 - Rural company, urban footprint

Rural broadband, urban footprint

Founded over 50 years ago, today this small, local broadband service provider serves several thousand customers. Rural broadband is particularly challenging, as low population density means higher deployment costs. "The demand has always been here," said a telco manager working for the client. "But service providers must be willing to invest the time and money to deliver the service. Our willingness to do that has meant higher levels of customer loyalty, and it's allowed us to grow."

The challenge: Competing against the Goliaths

Over the years, this provider has attempted to expand its service area to more profitable urban areas. But a small company going head-to-head against much larger providers us was not an easy proposition. "If we went into a new market, the 'big boys' would just swoop in to take all the accounts. It's difficult to compete," said the telco manager.

How to compete and differentiate against much larger providers with deeper pockets?

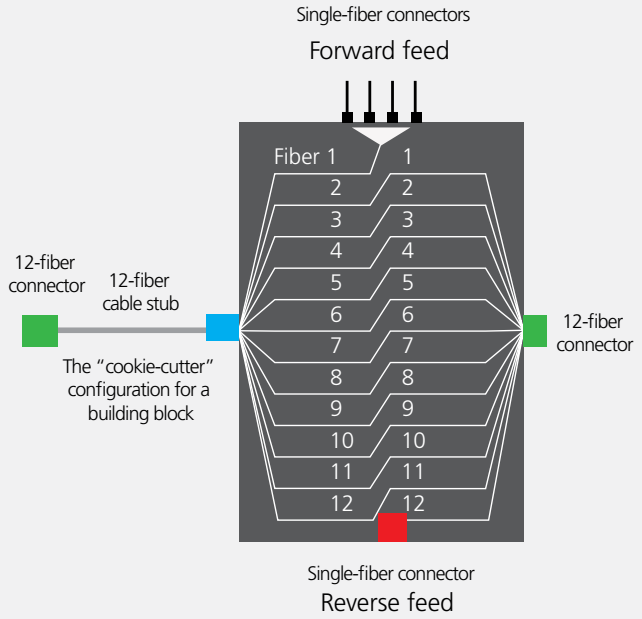
"Genius" layout

To find a new way to compete with the larger service providers, the telco created a specialized broadband business. "They wanted to do a test case with our fiber indexing solution," said a CommScope account manager, "to see if it would allow faster deployments with less fiber." Fiber indexing is the shifting of a fiber's position from one multifiber connector to another, within each terminal (see image to the right).

The results were encouraging: the telco called the no-splice, connectorized technology "genius" for its layout, loss calculation, and speed of deployment.

In the deployment that followed, the telco installed aerial distribution hubs that allowed fiber cable to cascade down streets on pole lines. The pilot phase of this project involved six locations, serving 150 homes. Fiber indexing terminals were placed on telephone poles and linked by multi-fiber cables in a linear, cascaded fashion.

How fiber indexing works



1

The process begins with a 12-fiber cable from the fiber distribution hub (FDH) entering the first index terminal.

2

Inside the terminal, the fibers divide and the signal from the fiber in the first position is routed to a 1:4 or 1:8 splitter for servicing local customers.

3

The remaining fibers are "indexed"—advanced one position in the order—then combined using a 12-fiber HFMOC.

4

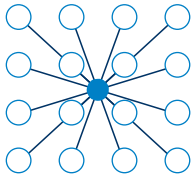
The exiting 12-fiber hardened cable connects to the next terminal where the indexing process is repeated.

50 percent fiber cable savings

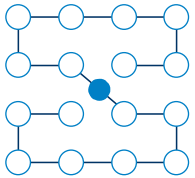
The total scope of the project was 3,000 homes passed, and the savings in fiber cable was considerable. "We're so small, we can't inventory as much material as we'd like," said the telco manager. "CommScope's fiber indexing technology let us connect these homes with less than half the usual amount of cable. That's been a huge help."

NETWORK ARCHITECTURE

Star



Linear



Linear topology of terminals led to:

50% less

cable usage

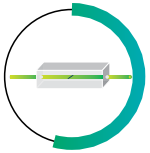
Fiber indexing technology reduces the amount of cable used to less than half of the amount used in a star topology network

CONNECTION OPTIONS

Fiber spicing

35

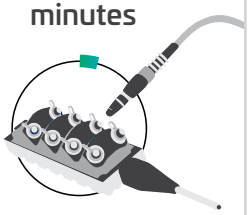
minutes



Hardened connectors

5

minutes



Use of pre-terminated connectors eliminates splicing, thus reducing the total time of connecting a customer to the fiber network

The right technology can create a competitive edge.

No going back

"It's worked so well, I don't think we'd ever go back to the traditional methods," said the telco manager. Fiber indexing has allowed the small firm to compete with much larger companies because they can deploy faster, with less labor, using less material. "We can focus on giving our customers better service, and hook them up faster than ever before. Initial construction now takes three weeks instead of nine, and, instead of four install calls a day, we can schedule as many as 10. I tell you, this has been a game-changer for us."

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Case Study

07 - Building fiber expertise

An ambitious plan

This state-owned incumbent telecom operator began as a postal and telegraph service more than 125 years ago. Today, they serve millions of citizens with telephony, mobile, and broadband services. Recognizing the importance of high-speed internet to economic growth and global competitiveness, the nation's president supported an ambitious FTTH program to cover the entire country.

The challenge: A lack of fiber knowledge

The initial phases—research, planning, standards setting, network design, and vendor selection—were completed by a relatively small group of experts, but large teams of fiber-optic technicians and installers would be needed for the deployment.

Since fiber expertise was limited to a small number of optical backbone specialists, and the telco did not even have a program to train technicians, this would prove to be their biggest challenge.

How did this telco develop an accelerated program to train field installers?

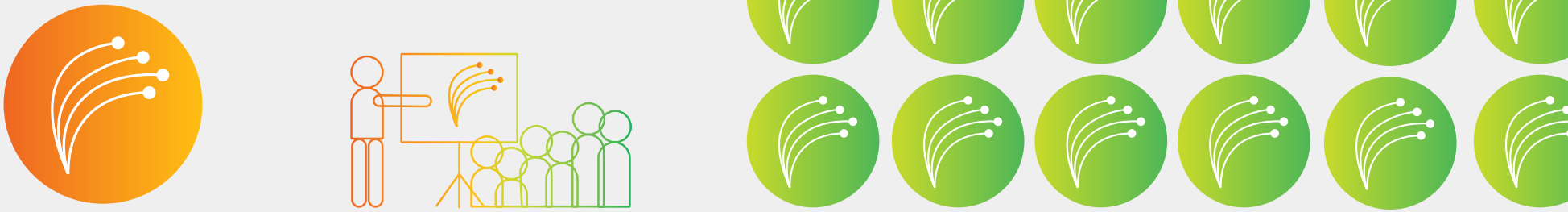
Knowledge transfer

Before the actual training began, townhall-style meetings were held. Putting a human face to this new technology was important, so local CommScope engineers who had worked on deployments in other countries shared their experiences. A train-the-trainers program was developed together with the local university; installation manuals and training materials were supplied in the local language. CommScope engineers supervised the initial installations, sharing practical advice and tips as well as ensuring that high standards and industry best practices were adopted.

It's all about your people

"Many of the older technicians, who'd worked with copper for decades, felt threatened by the new fiber technology," said the telco's training manager. "Working with fiber requires higher skill levels than working with copper. They thought they were obsolete. There was resistance at first, but drawing the parallels between fiber and copper allowed them to tap into their past experience and helped them feel more comfortable. The hands-on product training went a long way, and, ultimately, our technicians embraced the new technology. It just takes time to change people's mindsets."

CommScope's train the trainers program



500 CommScope trained trainers and technicians...

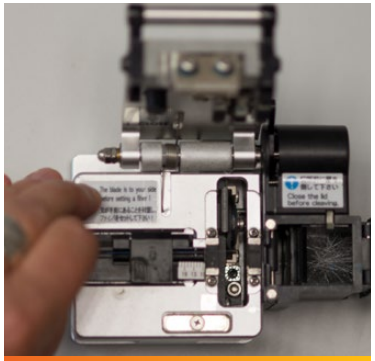
went on to train...

3000 installation technicians

Fiber fusion splicing in five steps

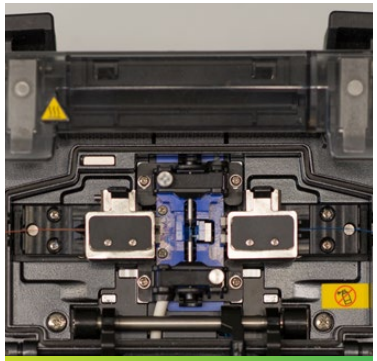
1

Fiber stripping and cleaning



2

Fiber cleaving

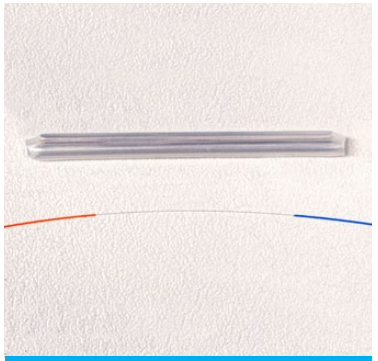


3

Fibers are joined in a fusion splicer

4

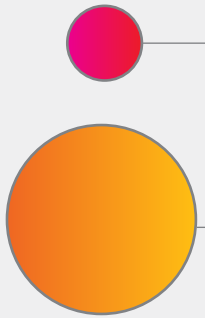
The display shows the quality of the fusion splice



5

Spliced fibers and protective sleeve (SMOUV)

Fusion splices are used to join two pieces of fiber-optic cable. Two strands of filament, each about 125 microns in diameter, are welded together so the laser light signals pass through the cable without interference. This complex process demands a high degree of precision.



A human hair and a fiber strand magnified 25,400%

Human hair diameter

Fiber strand diameter

Products that don't need special tools

Working with fiber generally requires special cable and splicing tools. But the telecom operator was able to deal with the shortage of experienced technicians by choosing products that could be installed by technicians with limited experience and a basic set of mechanical tools. One example is the FOSC 450 fiber-optic splice closure. Its cold seal gel technology does not require any electrical tools.

"This new technology changed everything. Our installations could be done by contractors who'd had just two hours of training. And they didn't need splicing equipment. It's made us much more competitive."

World leader in homes connected

Deployments began in the big cities, then moved out into the rural areas. CommScope directly trained more than 500 technicians for the project, who went on to train more than 3,000 installers. In deploying this network, the state-owned incumbent telco has achieved something remarkable: the country now has the highest FTTH penetration rate in the region, and it is widely recognized that their ICT (Information and Communications Technology) strategy has had a real impact on the country's economy and future development.

Invest in training your staff. Outside plant fiber will provide service for decades to come, so protect your investment by doing the job right the first time.

LEARN MORE

Web page >>

Video >>

CommScope Infrastructure Academy >>

CommScope Capabilities

Network application >>

Performance testing >>

Material science >>

Field training >>

Case Study

08 - Open and interoperable

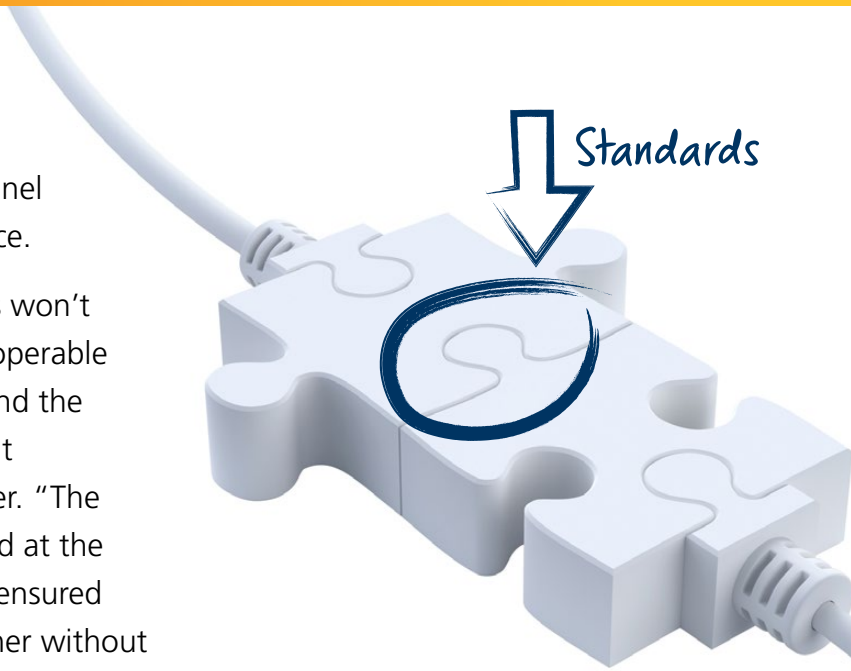
Connecting all the pieces

The country was ready for ultra-high-speed internet: this large, incumbent mobile and fixed-line service provider decided to introduce fiber-to-the-home (FTTH) to 40 cities and begin migrating their fiber-optic cable access network from copper-based xDSL. Smaller local players may have been first to market with FTTH, but the incumbent's dominant installed base and extensive coverage put them in pole position.

The challenge: Will the pieces fit together?

How did they build a standards-compliant, open and interoperable network?

Local guidelines called for a mix of national and international vendors for the FTTH infrastructure. To ensure multi-vendor interoperability, the telco established compliance to standards as a fundamental principle. Similar to other incumbents around the world, this service provider had extensive experience with copper access and fiber backbone networks—but not with FTTH network standards.



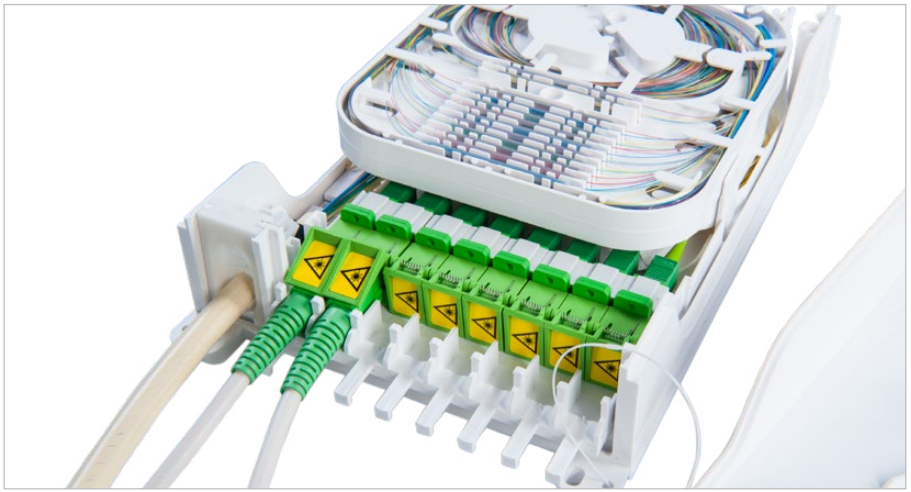
Upgrading network infrastructure brings unique challenges

A multi-vendor network must be flexible and upgradeable to new products as the technology evolves. "The scale of the national deployment meant that fiber interoperability had to be built up as an ongoing process. We worked with our customer to create internal standards guidelines that helped to streamline their bidding process," said a CommScope account manager. Once the network design process got underway, the local team began fiber technology training for installers and technicians.

MDU field trials

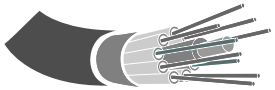
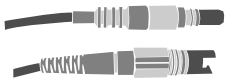
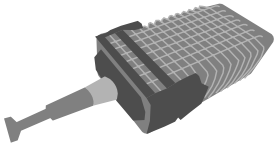
Many of the installations were slated for older multidwelling units (MDUs), where the cable shafts were small and hard to work in. CommScope's IFDB floor box was selected as it was compact enough to fit into these congested shafts, and its hinged connector panel allowed easy access for maintenance.

Bringing together different vendors won't work without clear open and interoperable standards. "In this case, the IFDB and the fiber cables were from two different vendors," said the account manager. "The standards and specifications defined at the beginning, followed by field trials, ensured that equipment would work together without any performance or installation issues."



IFDB floor box

Top 10 fiber standards for FTTH

PERFORMANCE		
IEC 61753-1	General and guidance for performance standards	
TEST AND MEASUREMENT		
IEC 61300-2 and -3 series	Fiber-optic interconnecting devices and passive components—Basic test and measurement procedures	
PRODUCTS: CABLES		
IEC 60793-2-50	Optical fibers—part 2-50: product specifications—sectional specification for class B single-mode fibers	
IEC 60754-2-50	Optical fiber cables—part 2-50: indoor cables—family specification for simplex and duplex cables for use in terminated cable assemblies	
PRODUCTS: CONNECTORS		
IEC 61755 series	Fiber-optic connector optical interfaces—optical interfaces for single mode fibers	
IEC 61754 series	Fiber-optic interconnecting devices and passive components—fiber-optic connector interfaces	
PRODUCTS: CLOSURES		
Telcordia GR-771	Generic requirements for fiber-optic splice closures	
EN 50411-2-4	Product specification for category A and S butt type closures	
EN 50411-2-10	Product specification for category G closures (FTTH and distribution closures)	
ITU-T L.13	Performance requirements for passive optical nodes—sealed closures for outdoor environments	

Standards Bodies

ITU

The International Telecommunication Union (ITU) is a specialized agency of the United Nations (UN) that is responsible for issues that concern information and communication technologies. Standardization was the original purpose of ITU. ITU-T standardizes global telecommunications (except for radio).

EU

European Standards (ENs) are documents that have been ratified by one of the three European Standardization Organizations (ESOs), CEN, CENELEC or ETSI; recognized as competent in the area of voluntary technical standardization as for the EU Regulation 1025/2012. A European Standard (EN) automatically becomes a national standard in each of the 34 CEN-CENELEC member countries.

IEC

The IEC (International Electrotechnical Commission) is the world's leading organization for the preparation and publication of International Standards for all electrical, electronic and related technologies. These are known collectively as "electrotechnology".

Telecordia

Telcordia is a subsidiary of the telecommunications company Ericsson. The company provides interconnection technology and clearinghouse solutions for numbering plan, routing, call billing, and technical standards coordination between competing telecommunications carriers.

Maintaining a healthy vendor ecosystem

"The team worked very closely with our customer to find products that best fit their needs—modular, easy to install, and compliant to the relevant IEC and European Standards (EN)," said the CommScope account manager. "Establishing and maintaining standards keeps the vendor ecosystem healthy as well. When a problem comes up, a clear demarcation facilitates troubleshooting and avoids finger-pointing and conflict between vendors."

Summary

"Today, this FTTH network has hundreds of products from dozens of different vendors. Openness and interoperability are the key to making it work. Our customer is confident they can upgrade or introduce new products into the network without impacting existing services."

Standards provide the framework for an open, multi-vendor network that can grow as technologies evolve.

LEARN MORE

MDU >>

Central office >>

Fiber closures >>

White paper >>

Video >>

Products in this network

IFDB >>

FOSC 350, FOSC 450 >>

Splitters >>

NG4access >>

FiberGuide system >>

Copper closures >>

Case Study

09 - An enclosure that goes the extra mile

Going the extra mile

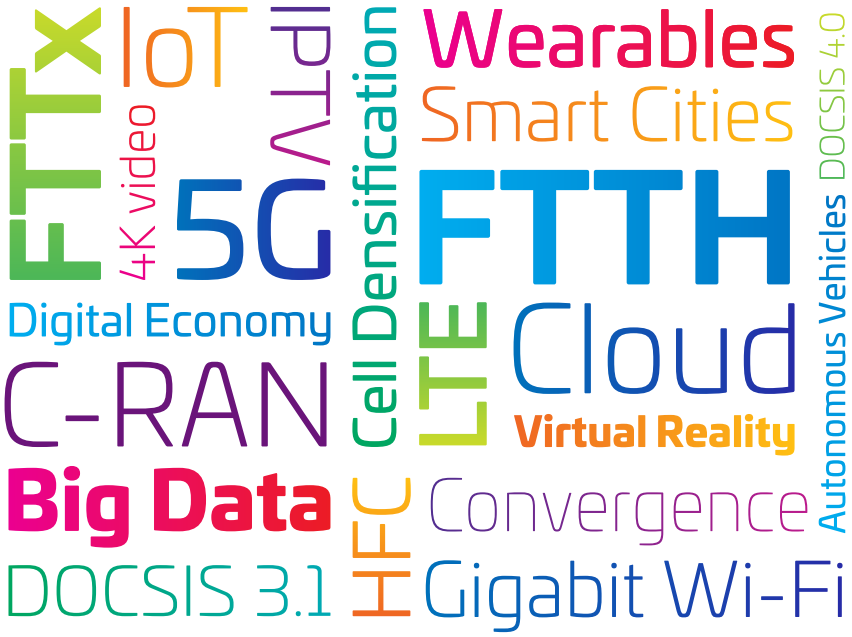
Fiber optic splice closures (FOSC®) are essential for a modern network and in Asia-Pacific there is intense competition for high quality, low cost FOSC solutions. A large APAC fiber-to-the-home (FTTH) operator sought a durable and reliable closure solution that would safeguard its broadband network today and beyond while keeping costs within reason.

There are many applications where an external network has to operate under various conditions and this makes FOSC vital in protecting fiber nodes located outdoors. FOSC must also deliver the maneuverability, scalability and reliability a modern network needs and they need to be easy to maintain—all factors that directly impact an operator's capital expenditure (CAPEX) and operating expenditure (OPEX).

Moving fiber forward

Closures house and protect fibers and modules at splice points and are critical to expanding network capacity and productivity. The operator chose FOSC, which combine fiber management hardware with a highly reliable sealing system. The CommScope gel FOSC utilizes memory-function gel as a sealing material which possesses both the flexibility of artificial rubber and the sealing qualities of grease.

Megatrends drive the need for fiber connectivity



Installation made easy

Reduced installation time was another key factor in the operator's decision to use CommScope's FOSC solution. CommScope's FOSC solutions are designed for installation without special tools or skills. On-site installation takes 15 percent less time than with installing traditional "horseshoe" gel closures. The operator would also reduce on-site maintenance time by 30 percent using CommScope's FOSC solution.

Passing the weather test

CommScope's FOSC solutions resist moisture, vibration, temperature, chemicals and ultraviolet rays thanks to advanced gel technology that protects connections.

Connections that count

CommScope's FOSC solutions were designed leveraging over 30 years of historical data on seal performance from deployments across the globe. They simplify splice management and maintenance. Our customer has peace of mind their infrastructure will be a stable platform for many years with the ability to grow to meet increasing network demands.

LEARN MORE

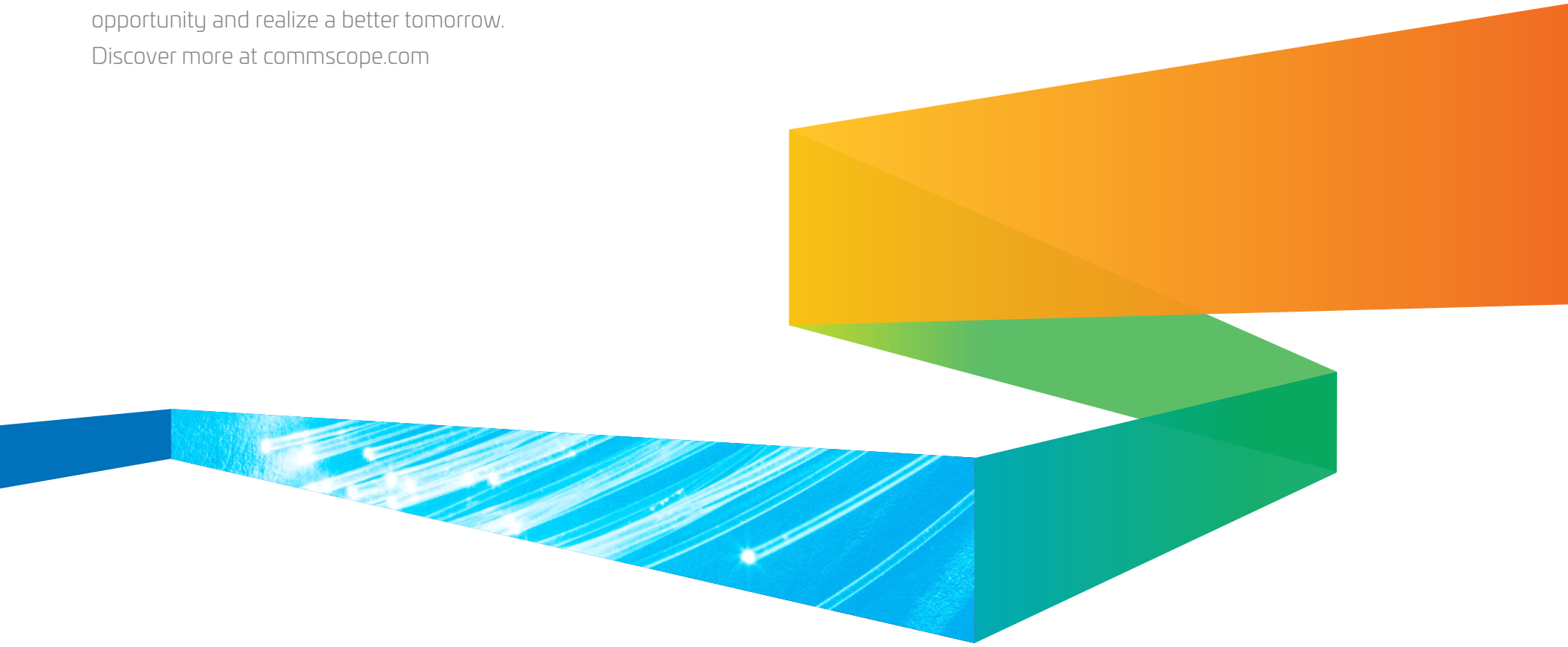
Web page >>

Blog: Top 10 CommScope Innovations: Outside Plant Closure Solutions >>

Keep your network running, even in the harshest conditions.

COMMSCOPE®

CommScope pushes the boundaries of communications technology with game-changing ideas and ground-breaking discoveries that spark profound human achievement. We collaborate with our customers and partners to design, create and build the world's most advanced networks. It is our passion and commitment to identify the next opportunity and realize a better tomorrow. Discover more at commscope.com



www.commscope.com

Visit our website or contact your local CommScope representative for more information.

CO-114011.2-EN (03/20)