FTTH Solutions with Rural Taps

Bringing cost savings and efficiency to rural and medium density FTTH deployments

COMMSCOPE®

FTTH deployments in areas with low to medium subscriber density can cost significantly more per home passed than in dense urban or MDU (multi-dwelling unit) environments. Fiber optic taps are optimized for rural FTTH: they reduce costs, improve the business case, and can help secure project funding.

Urban and suburban FTTH networks typically use splitters to distribute optical signals. The network topology is hub-and-spoke, with the splitter in the middle. This centralized split architecture is the most flexible, and usually the most expensive. Distributed split topologies involve two stages of splitters, with one closer to the central office or head end and one closer to the subscriber, balancing flexibility with cost.

A distributed tap architecture is different. It uses fiber optic taps instead of splitters, and a linear daisy-chain topology.

Imagine taking a fiber in a fiber cable, cutting it in the middle, and splicing a fiber optic tap into the fiber. Now the signal can pass through the tap and continue down the fiber, while the tap siphons or drops off a portion of the signal for locally connected subscribers. Multiple taps can be placed where needed down the line, until the optical link budget is exhausted or the maximum number of subscribers per OLT (Optical Line Terminal,) port (typically 32, though 64 or more are supported,) has been reached.

How are Rural Taps optimized for rural FTTH?

Cables
Less fiber cable is required, a significant cost savings due to the long distances of rural deployments. Also, the same low fiber count cable can be used to pass all homes.

Cabinet
Tap architecture often avoids the need for an equipment cabinet and mounting pad, as well as cabinet installation labor. Two four-fiber cables are run directly into the serving area, without the need of a cabinet to house splitters and connections.

Splicing
Installers do not need to maintain complicated splice maps, as the same fiber strand is spliced the same way at every tap in a cascade.
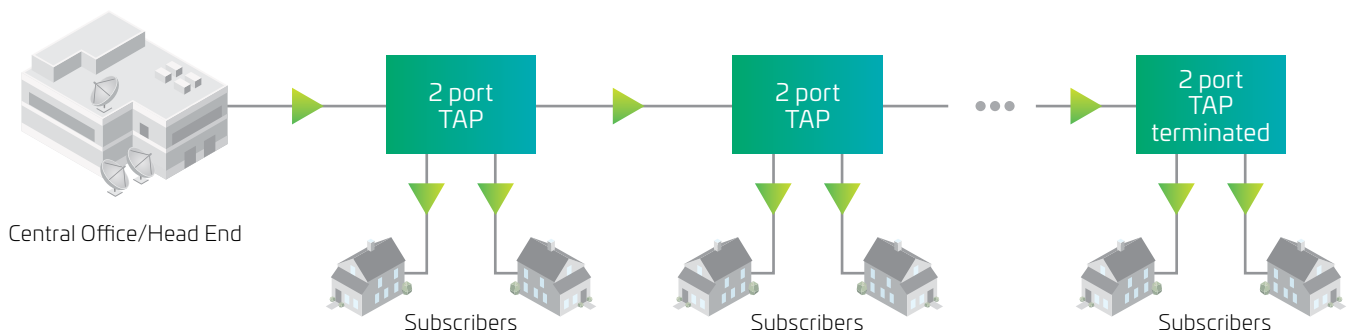
Cost
A simplified design with less cable and less equipment means faster installations, at a lower cost.

Beyond rural FTTH, fiber optic taps are suitable for low to medium density areas, or wherever the cost of fiber cable is an issue.

Beyond rural FTTH, taps are suitable for low to medium density areas or wherever fiber is scarce.

Central Office/Head End

2 port TAP — Subscribers

2 port TAP — Subscribers

2 port TAP terminated — Subscribers

Two, four, or eight drop ports

Rural Taps are available in 2-port, 4-port, and 8-port models, depending on the number of drop ports required. For each model, different tap values (ranging from -4dB to -22dB) are available, depending on how much optical power should be dropped off at each location. The tap value represents the loss between the input (distribution fiber) and the drop ports. The remaining optical power passes through the tap to the output distribution fiber, towards the next tap. The closer the tap is to the OLT, the less power (proportionately) should be dropped off.

Drop ports from the tap are pre-connectorized, to facilitate a simple connect and disconnect of the customer drop cable.

The table of tap values on the right is used to calculate optical link budgets for a chain of taps. *Insertion loss* specifies optical loss from the input distribution fiber to the output fiber, which leads to the next tap. The final tap in the chain has no output fiber and hence is "terminating." *Drop loss* specifies optical loss from the input distribution fiber to the drop ports. All drop ports have the same loss. *Tap value* corresponds to the maximum drop loss of the tap.

Tap Optical Characteristics	
Wavelength window	1260nm to 1620nm
Port to Port isolation	>55dB
Tap to Out isolation	>55dB
Return loss	>55db

Tap value	Insertion loss (dB)*		Drop loss (dB)	
	Typical	Max	Typical	Max
2-port taps				
21 dB	0.25	0.40	19.89	21.95
19 dB	0.35	0.50	16.87	18.45
17 dB	0.40	0.60	15.94	17.55
15 dB	0.60	0.80	13.91	15.25
14 dB	0.80	1.00	12.18	13.25
12 dB	1.06	1.30	10.85	11.85
10 dB	1.69	2.00	9.13	10.05
8 dB	2.32	2.70	7.90	8.75
7 dB	3.58	4.10	6.48	7.25
5 dB	5.36	6.00	5.43	6.05
4 dB terminating	n/a	n/a	3.61	3.95
4-port taps				
21 dB	0.40	0.60	19.31	20.95
19 dB	0.60	0.80	17.27	18.65
17 dB	0.80	1.00	15.54	16.65
15 dB	1.06	1.30	14.21	15.25
13 dB	1.69	2.00	12.49	13.45
11 dB	2.32	2.70	11.26	12.15
10 dB	3.58	4.10	9.84	10.65
9 dB	5.36	6.00	8.79	9.45
7 dB terminating	n/a	n/a	6.97	7.35
8-port taps				
22 dB	0.60	0.80	20.48	21.95
21 dB	0.80	1.00	18.74	19.95
19 dB	1.06	1.30	17.41	18.55
17 dB	1.69	2.00	15.68	16.75
15 dB	2.32	2.70	14.45	15.45
14 dB	3.58	4.10	13.03	13.95
12 dB	5.36	6.00	11.96	12.75
11 dB terminating	n/a	n/a	10.13	10.65

* For Mini-OTE 300, add 0.4 dB to the insertion loss to accommodate two mated connectors.

** 8 Drop 22dB fiber optic tap is available in Mini-OTE 300 and MST tap terminals
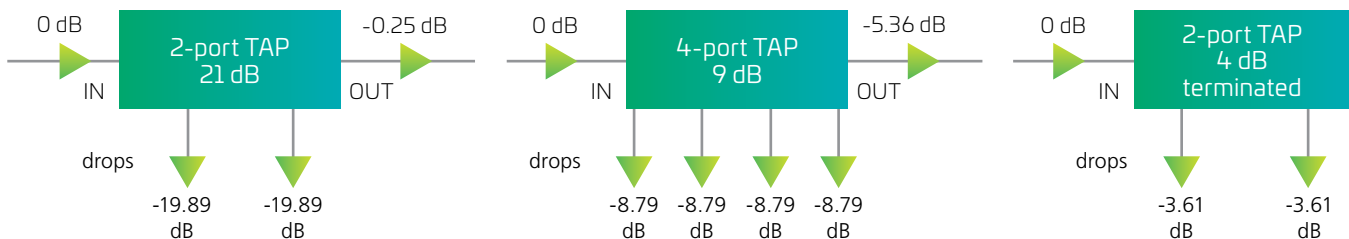
Rural Taps are available for the FOSC 450 splice closures, the Mini-OTE 300 enclosures, the OFDC-C12 and MST terminals.

The FOSC 450 is a gel sealed splice closure that can accept a wide variety of fiber cables, while the Mini-OTE 300 (Optical Terminal Enclosure,) is a fully sealed terminal, which features hardened connectors where splicing is not required. The OFDC-C12 is a sealed terminal with SC/APC connectors. Splicing is required to the input and thru-put fibers in the OFDC Rural TAP closures. The MST 4x3 terminals are fully sealed terminals designed for plug-and-play installations.

FOSC 450 with Rural Taps

Rural Taps expand FOSC 450 capabilities, providing cabling flexibility and simplifying installations. The FOSC 450 tap bundle includes the environmentally gel-sealed closure and a tap module with two trays.

The tap module is spliced in-line with the distribution fiber. Within the closure, the tap trays consist of two sections. One is a single-depth tray which houses the optical module, and the second section is the double-depth tray which contains the adaptors for the drop connections.

When purchased as a bundle, the 2 and 4-port models ship in the FOSC 450A closure. The 8-port model ships in the FOSC 450B closure.

The FOSC 450 accommodates a wide variety of fiber cables, including armored, all dielectric, and flat-drop style cables. Please note: for armored cable, the B closure is recommended for use with 2 and 4-port tap trays.
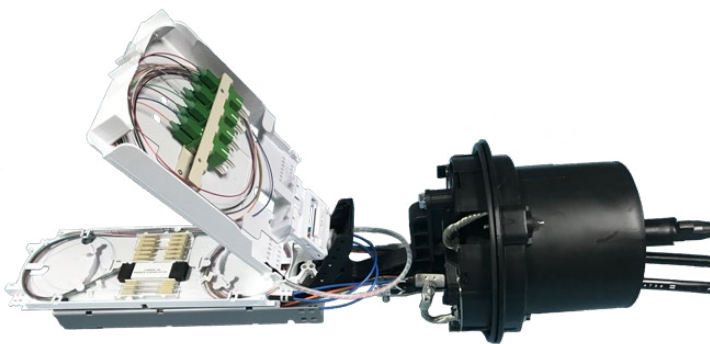
Tap value	Part number
FOSC 450 with 2-port taps	
21 dB	FOSC450-A4-4-TAP-2P-21
19 dB	FOSC450-A4-4-TAP-2P-19
17 dB	FOSC450-A4-4-TAP-2P-17
15 dB	FOSC450-A4-4-TAP-2P-15
14 dB	FOSC450-A4-4-TAP-2P-14
12 dB	FOSC450-A4-4-TAP-2P-12
10 dB	FOSC450-A4-4-TAP-2P-10
8 dB	FOSC450-A4-4-TAP-2P-08
7 dB	FOSC450-A4-4-TAP-2P-07
5 dB	FOSC450-A4-4-TAP-2P-05
4 dB	FOSC450-A4-4-TAP-2P-04T (terminating tap)
FOSC 450 with 4-port taps	
21 dB	FOSC450-A4-4-TAP-4P-21
19 dB	FOSC450-A4-4-TAP-4P-19
17 dB	FOSC450-A4-4-TAP-4P-17
15 dB	FOSC450-A4-4-TAP-4P-15
13 dB	FOSC450-A4-4-TAP-4P-13
11 dB	FOSC450-A4-4-TAP-4P-11
10 dB	FOSC450-A4-4-TAP-4P-10
9 dB	FOSC450-A4-4-TAP-4P-09
7 dB	FOSC450-A4-4-TAP-4P-07T (terminating tap)
FOSC 450 with 8-port taps	
21 dB	FOSC450-B6-6-TAP-8P-21
19 dB	FOSC450-B6-6-TAP-8P-19
17 dB	FOSC450-B6-6-TAP-8P-17
15 dB	FOSC450-B6-6-TAP-8P-15
14 dB	FOSC450-B6-6-TAP-8P-14
12 dB	FOSC450-B6-6-TAP-8P-12
11 dB	FOSC450-B6-6-TAP-8P-11T (terminating tap)

OFDC C12 Series with Rural Taps

CommScope's OFDC-C12 terminal is now available with factory integrated fiber optic taps, with SC/APC connectors for drop terminations. These terminals accept a wide range of distribution and drop cables, to meet the challenges of today's FTTH network architecture.

The OFDC-C12 includes easily accessible input and thru-put fibers for splicing. And easy entry to the terminal, without the need for special tools, is assured by CommScope's advanced gel sealing technology.

OFDC terminals have an IP-68, 2-meter waterhead rating. They can be installed on pedestals, in hand holes, attached to poles, or strand-mounted. Strand, ped, and pole-mount bracket accessory kits are available for easy installation.

The OFDC-C12 Rural Tap terminal accommodates 72 fusion splices. The compact design features separate zones for looped cable storage and for splicing and patching to drop cables. The hinged cover is designed so that just the bottom half can be lifted to access the drop cable connection area.

Terminals are available in 2, 4, and 8 port configurations. The integrated taps have color-coded pigtails that are factory loaded into the patch panel. Each OFDC Rural Tap terminal includes labels on the closure cover that identify the tap dB value and number of drops. See the table for the 2, 4, and 8 port configurations.

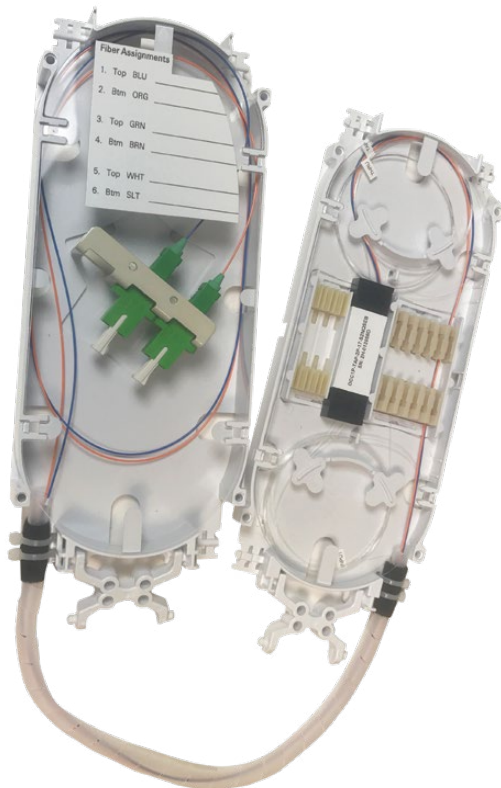| Tap value	Part number
OFDC-C12 with 2-drop taps	
21 dB	OFDC-C12-S2/20-2T21-N-96
19 dB	OFDC-C12-S2/20-2T19-N-96
17 dB	OFDC-C12-S2/20-2T17-N-96
15 dB	OFDC-C12-S2/20-2T15-N-96
14 dB	OFDC-C12-S2/20-2T14-N-96
12 dB	OFDC-C12-S2/20-2T12-N-96
10 dB	OFDC-C12-S2/20-2T10-N-96
8 dB	OFDC-C12-S2/20-2T08-N-96
7 dB	OFDC-C12-S2/20-2T07-N-96
5 dB	OFDC-C12-S2/20-2T05-N-96
4 dB	OFDC-C12-S2/20-2T04T-N-96 (terminating tap)
OFDC-C12 with 4-drop taps	
21 dB	OFDC-C12-S2/40-4T21-N-96
19 dB	OFDC-C12-S2/40-4T19-N-96
17 dB	OFDC-C12-S2/40-4T17-N-96
15 dB	OFDC-C12-S2/40-4T15-N-96
13 dB	OFDC-C12-S2/40-4T13-N-96
11 dB	OFDC-C12-S2/40-4T11-N-96
10 dB	OFDC-C12-S2/40-4T10-N-96
9 dB	OFDC-C12-S2/40-4T09-N-96
7 dB	OFDC-C12-S2/40-4T07T-N-96 (terminating tap)
OFDC-C12 with 8-drop taps	
21 dB	OFDC-C12-S2/80-8T21-N-96
19 dB	OFDC-C12-S2/80-8T19-N-96
17 dB	OFDC-C12-S2/80-8T17-N-96
15 dB	OFDC-C12-S2/80-8T15-N-96
14 dB	OFDC-C12-S2/80-8T14-N-96
12 dB	OFDC-C12-S2/80-8T12-N-96
11 dB	OFDC-C12-S2/80-8T11T-N-96 (terminating tap)

Accessories

Part number	Description
OFDC-C12-BRKSTRAND	Strand mount bracket, set of two hangers
BOND-GRD-WIRE-6AWG	36 inch Ground wire for OFDC
OFDC-C12-GROUNDKIT	Ground wire for OFDC
OFDC-C12-POLE-BRKT-KIT	OFDC-C12 Pole Mount Bracket Kit. Attaches to pole by strapping or screwing a lug into a wooden pole. Imperial (US) hardware
OFDC-C12-1 PIECE-POLE-BRKT	OFDC-C12 One Piece Pole Mount Bracket Kit. Attaches to pole by screwing a lug into a wooden pole. Imperial (US) hardware
S1515-30X1.5X700-AUTO-N	Gel strip, 1 pc is a roll of 70 cm / 27 inch. MOQ is 4 pc (in a bag). Required for OFDC C12 for 2 cables per port.
FOSC-ACC-LBT-WRAP-100	Velcro Tape for buffer tube routing
SMOUV-1120-02-PK	SMOUV Heat Shrink Splice Protective Sleeve 45.00 mm (1.77 in), pack of 100 pcs

FOSC® 450 Rural Tap trays

Rural Tap trays can also be ordered separately, without the closure, to add new functionality to an existing FOSC 450 closure, or for stocking purposes. Rural Tap trays consist of two connected FOSC trays: a splice tray containing the tap device, and one containing the output connectors and connector bulkhead.

Please note that there are size and tray position considerations when adding Rural Tap trays to FOSC 450 closures. In particular, the 2 and 4-port versions not only fit FOSC 450 A and B closures, but also FIBRBox and AIR FOSC closure platforms. The 8-port versions will only fit FOSC 450B and FIBRBox.

For more information on the FOSC 450, including configuration options and parts & accessories, please refer to the FOSC 450 ordering guide.

Tap value	Part number
2-port tap trays	
21 dB	FOSC-ACC-A/B-TRAYTAP-2P-21
19 dB	FOSC-ACC-A/B-TRAYTAP-2P-19
17 dB	FOSC-ACC-A/B-TRAYTAP-2P-17
15 dB	FOSC-ACC-A/B-TRAYTAP-2P-15
14 dB	FOSC-ACC-A/B-TRAYTAP-2P-14
12 dB	FOSC-ACC-A/B-TRAYTAP-2P-12
10 dB	FOSC-ACC-A/B-TRAYTAP-2P-10
8 dB	FOSC-ACC-A/B-TRAYTAP-2P-08
7 dB	FOSC-ACC-A/B-TRAYTAP-2P-07
5 dB	FOSC-ACC-A/B-TRAYTAP-2P-05
4 dB	FOSC-ACC-A/B-TRAYTAP-2P-04T (terminating tap)
4-port tap trays	
21 dB	FOSC-ACC-A/B-TRAYTAP-4P-21
19 dB	FOSC-ACC-A/B-TRAYTAP-4P-19
17 dB	FOSC-ACC-A/B-TRAYTAP-4P-17
15 dB	FOSC-ACC-A/B-TRAYTAP-4P-15
13 dB	FOSC-ACC-A/B-TRAYTAP-4P-13
11 dB	FOSC-ACC-A/B-TRAYTAP-4P-11
10 dB	FOSC-ACC-A/B-TRAYTAP-4P-10
9 dB	FOSC-ACC-A/B-TRAYTAP-4P-09
7 dB	FOSC-ACC-A/B-TRAYTAP-4P-07T (terminating tap)
8-port tap trays	
21 dB	FOSC-ACC-A/B-TRAYTAP-8P-21
19 dB	FOSC-ACC-A/B-TRAYTAP-8P-19
17 dB	FOSC-ACC-A/B-TRAYTAP-8P-17
15 dB	FOSC-ACC-A/B-TRAYTAP-8P-15
14 dB	FOSC-ACC-A/B-TRAYTAP-8P-14
12 dB	FOSC-ACC-A/B-TRAYTAP-8P-12
11 dB	FOSC-ACC-A/B-TRAYTAP-8P-11T (terminating tap)

Mini-OTE 300 with Rural Taps

CommScope's Mini-OTE 300 (Optical Terminal Enclosure,) is a unique solution for splicing, termination, and pass-through cable requirements in FTTH networks. Featuring pre-connectorized, hardened, full-size adapter ports, the Mini-OTE 300 accelerates fiber deployment for new subscriber activation and service, minimizing labor costs.

The Mini-OTE 300 ensures seamless integration into existing infrastructure. Sealed in a gasketed, hardened, plastic enclosure, the Mini-OTE provides reliable, uninterrupted performance in the outside plant environment. The terminal is tested to Telcordia GR-771.

Field-friendly with accessible design features, the Mini-OTE 300 can be installed in pedestal, hand hole, pole, or strand-mount applications for fast and easy integration into the network for residential and commercial services. Strand-mount brackets and pole-mount bracket accessory kits are available. The two-section terminal is re-enterable, but shipped closed and ready for quick plug-n-play installation. The terminals include factory-integrated taps with the Tap Input, Tap Through, and Drops connected to the angled adapter ports on the cover of the Mini-OTE. The terminals have yellow plugs factory installed in the drop ports, and a ground plug, eliminating the need to open the terminal during installation.

The Mini-OTE 300 terminals with integrated Rural Taps are available in 4, 8, and 12 port configurations. The Tap Input port is color-coded green, and the Tap Through port is color-coded orange. See the right hand table for port layouts for the 2, 4, and 8 port tap models.

Mini-OTE 300 tap terminals are produced for plug-and-play convenience with connectorized drops, input, and pass through ports. If desired, the terminal can be opened and fiber installed for spliced drops and cable storage. An accessory kit is required to add cable, it's #760242850 OTE-M MAIN SUBASSY KIT.

Mini-OTE 300 with 8-port taps

Tap value	Part number
Mini-OTE 300 with 2-port taps	
22 dB	OTE-12MH-18-220G03
21 dB	OTE-04MH-12-210G03
19 dB	OTE-04MH-12-190G03
17 dB	OTE-04MH-12-170G03
15 dB	OTE-04MH-12-150G03
14 dB	OTE-04MH-12-140G03
12 dB	OTE-04MH-12-120G03
10 dB	OTE-04MH-12-100G03
8 dB	OTE-04MH-12-080G03
7 dB	OTE-04MH-12-070G03
5 dB	OTE-04MH-12-050G03
4 dB	OTE-04MH-12-04TG03 (terminating tap)

Tap value	Part number
Mini-OTE 300 with 4-port taps	
21 dB	OTE-08MH-14-210G03
19 dB	OTE-08MH-14-190G03
17 dB	OTE-08MH-14-170G03
15 dB	OTE-08MH-14-150G03
13 dB	OTE-08MH-14-130G03
11 dB	OTE-08MH-14-110G03
10 dB	OTE-08MH-14-100G03
9 dB	OTE-08MH-14-090G03
7 dB	OTE-08MH-14-07TG03 (terminating tap)
Mini-OTE 300 with 8-port taps	
21 dB	OTE-12MH-18-210G03
19 dB	OTE-12MH-18-190G03
17 dB	OTE-12MH-18-170G03
15 dB	OTE-12MH-18-150G03
14 dB	OTE-12MH-18-140G03
12 dB	OTE-12MH-18-120G03
11 dB	OTE-12MH-18-11TG03 (terminating tap)

Port layout for Mini-OTE 300 Taps

Row	Port number	Function
Mini-OTE 300 with 2-port taps		
1	1	Drop
	2	Drop
	3	Tap Input
	4	Tap Through
Mini-OTE 300 with 4-port taps		
1	1	N/A
	2	N/A
	3	Tap Input
	4	Tap Through
2	1	Drop
	2	Drop
	3	Drop
	4	Drop
Mini-OTE 300 with 8-port taps		
1	1	N/A
	2	N/A
	3	Tap Input
	4	Tap Through
2	5	Drop
	6	Drop
	7	Drop
	8	Drop
3	9	Drop
	10	Drop
	11	Drop
	12	Drop

MST with Rural Taps

CommScope's MST (Multiport Service Terminal) provides a fully sealed solution for Rural Tap terminals utilizing the MST 4x3 housing with full-sized adapter ports. The stubless terminals are factory-integrated with an eight drop tap, and include ports for input, through, and drops. The plug-and-play design allows quick installation as well as a reliable solution for rural areas within the FTTH network. The adapters have color-coded dust caps to identify the port type, and a large color code on the housing for easy visual identification of the tap dB value in aerial installations. The terminal is IP68 rated, offering uninterrupted performance in the outside plant environment.

Tap value	Part number
MST 8-Drop Taps	
22 dB	MST-10RH00-N822T
21 dB	MST-10RH00-N821T
19 dB	MST-10RH00-N819T
17 dB	MST-10RH00-N817T
15 dB	MST-10RH00-N815T
14 dB	MST-10RH00-N814T
12 dB	MST-10RH00-N812T
11 dB	MST-09RH00-N811TT (terminating tap)

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

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