



Data center and fiber services for hyperscale and cloud providers

COMMSCOPE®



Capacity expansion simplified

In their own facilities and across co-location environments, operators of hyperscale and cloud-based data centers struggle to meet the rising demand for capacity. High-quality, high-demand applications and massive compute requirements are pushing the limits of existing optical capacity and data center space. Creating and maintaining additional capacity is time consuming, complex and staff-intensive. The right partner can make all the difference.

Driven by vision, technical expertise and innovative thinking, CommScope is a global leader of data center infrastructure solutions. Through the acquisition of the ARRIS Professional Services group, we are now able to help the world's largest data center owners or operators prepare, design, test and manage the capacity needed to fuel their rapid business expansion.

We're ready to put our unmatched skills, staff and experience to work for you, as we:

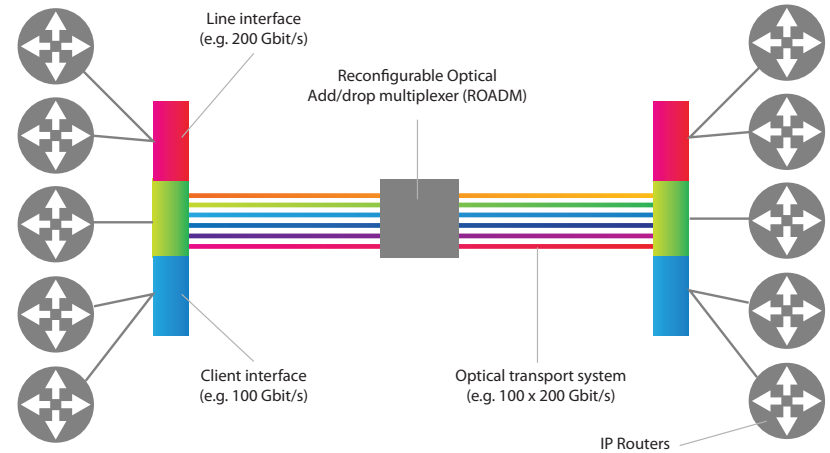
- Project manage new facility preparation
- Pre-integrate critical wiring and infrastructure
- Analyze, troubleshoot and remedy fiber routes
- Design data center layouts for space, power and cooling efficiency
- Deploy equipment with complete rack, stack and wire capabilities
- Lay out and install infrastructure and equipment
- Splice, install, clean and test fiber connections
- Provide and manage repair services
- Manage 24/7 NOC services
- Document data center architecture

Services we offer

- Vendor delivery management
- Turnkey services for data center, co-location and hub facilities
- Fiber services: Characterization, remediation and documentation
- Rack and roll
- Return material authorization (RMA)
- Smart/Remote hands
- Decommissioning

Vendor delivery management (VDM)

CommScope vendor delivery management ensures capacity projects are in step with your performance requirements, timeframes and budget. Having executed hundreds of data center projects, CommScope has the expertise to help get new facilities up and running quickly, cost-effectively and with minimal staff demands. We provide experienced and capable oversight of third-party vendors. Using precise planning and stringent accountability metrics, we manage the end-to-end delivery of projects, such as those involving dark fiber, leased circuits and co-location space. In addition, we provide comprehensive infrastructure design, deployment and documentation services—helping ensure that the new facility is up and running when you are ready. Then, we fully document the environment, providing your staff with a blueprint that can streamline maintenance, operations and troubleshooting.



Challenges

- Knowing and planning for all requirements
- Managing all vendors to ensure they deliver to contract/MSA
- Schedule and progress reporting
- Project risk and issue management
- Recording of assets (service ID's, LOA's, termination points, test results)
- Saving money (service acceptance, upgrades/cease and re-provide, disconnections)
- Network/asset auditing (data integrity)
- Measuring vendor performance



Solutions for VDM

- Requirement consultation
- Review orders against requirements
- Manage end-to-end services during the delivery lifecycle
- Liaison between the client procurement teams and vendors
- Review vendor standards against MSA for service acceptance
- Update inventory records and produce supporting documentation for the network management teams
- Inventory management and audit/cleansing for data integrity
- Manage disconnections



Benefits

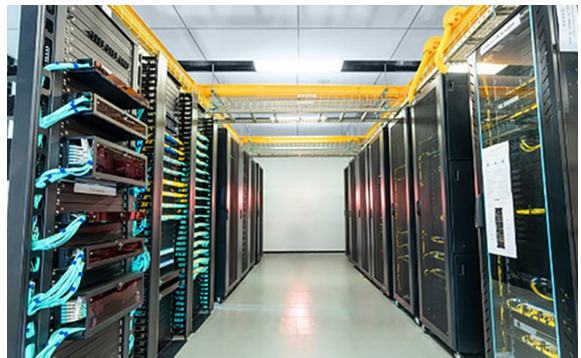
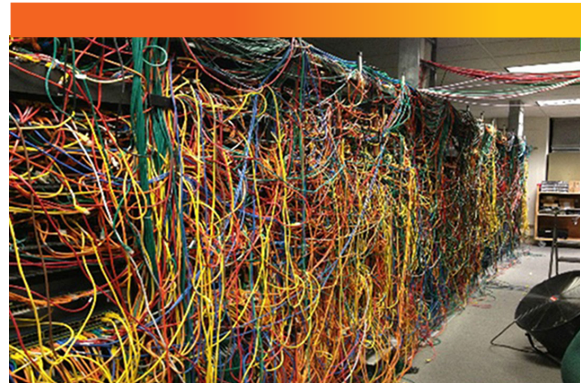
- Project delivery on time and on budget
- Free up in-house resources for other, more strategic tasks
- Take advantage of expertise and processes developed in service of the largest, most demanding operators in the world.
- Scaling with fewer resources

Turnkey services for data center, co-location and hub facilities

Whether onsite, in a multi-tenant data center or in a remote location—or whether new build or existing facility expansion, hub or POP—adding capacity is complex. Marshalling human resources and materials to meet a tight timeline in a specific location requires careful planning and strict project management. Having one point of contact and accountability for everything is the key to meeting budgets and timelines. CommScope can handle the entire job:

- Design—power, cooling, rack and shelf
- Materials management
- Installation—rack, stack and wire
- Configuration and commissioning
- Testing and optimization
- Decommissioning

From designs, to wire and cable management, to documentation, we ensure that the resulting facility meets operator specifications for professionalism, safety and serviceability.



Challenges

- Hundreds of sites to install
- Constantly evolving and expanding
- Difficult to service
- Environmental mess inside the data center
- Limited expert resources
- Cost/budget restrictions



Solutions for turnkey services

- Installation
 - Staging
 - Configuration
 - Rack and stack
 - Power
 - Card installs
 - Patching—fiber, management/copper
 - Maintaining standards
 - Updating records and opening tickets
- Testing/optimizing
 - Optical
 - Electrical
 - Connection verification testing
 - Bit error rate (BER) testing



Benefits

- Improved quality through dedicated focus and inspection
- Increased capacity turned up ahead of schedule
- Improved scalability
- Reduced fault detection and recovery times and costs

Fiber services: Characterization, remediation and documentation

Fiber characterization and remediation

CommScope's Fiber Services teams bring new fiber routes on line. Using industry-leading test gear and analysis, we document the physical and logical attributes of each fiber span, measure the quality and continuity of fiber routes and coordinate with internal resources and/or external vendors to ensure remediation of any issues detected.

Typically, these projects initiate with customer specifications and requirements for the leased capacity. Next, the CommScope project manager plans site visits to test the capabilities of the circuit. These events require a great deal of coordination with the customer, vendor and, in many cases, third parties potentially involved in fusion splicing or other remedial work. These activities are usually managed within tight timeframes that are dictated by narrow maintenance windows scheduled as part of project planning.



Documentation

CommScope provides and maintains documented route and span drawings for existing owned, third-party leased, future and idle routes. Our tools enable route and span information to be updated as changes take place—greatly improving efficiency and future serviceability for things like PoP locations, cable/duct sizes, routing and utilization, circuits and total loss A-Z.



Challenges

- Leased/dark fiber not meeting specs
- Non-existent or limited field resources for fiber characterization
- Technological advances necessitate higher fiber quality
- Obsolete or inaccurate fiber inventory
- Uncertainty where fiber network assets and data are located hinders troubleshooting and recover



Solutions for fiber services

- Management of fiber delivery
- Field testing of end-to-end fiber paths including the use of various types of OTDR modules
- CD/PMD (chromatic dispersion/polarization mode dispersion) testing
- 10G LAN/PHY and WAN/PHY bit error rate (BER) testing
- Trace and fiber termination analysis
- Coordination of corrective actions to remediate deficiencies
- Fiber fusion splicing on inside plant (ISP) and outside plant (OSP)
- OSP construction coordination
- Consolidation of database onto one platform
- Documentation of detailed fiber route
- Fiber route connectivity schematic



Benefits

- Lower cost of delivery
- Accelerated turn up of new capacity
- Assurance of highest quality
- Future scale and serviceability
- Expertise where most needed

Rack and roll

With pressures to add capacity and increase quality of service—while maintaining business as usual (BAU)—hyperscalers and cloud operators need innovative solutions. CommScope’s rack and roll approach enables you to implement new architectures and new equipment while lowering costs, improving standardization and quality, shortening lead times, reducing waste, and minimizing disruption to ongoing operations.

The keys to a successful rack and roll project are careful pre-planning and design; efficient offsite production-line construction of every module, rack and system; and timely on-site delivery for faster installation and turn up.



Challenges

- Having all items at the right place at the right time for an efficient installation
- Limited on-site staging and storage space
- Time lag to deploy
- Environmental mess and disposal challenges
- Inability to handle scope-of-work changes mid-build
- Inventory management and cost accounting
- Labor cost of having outside vendors on-site for weeks or a month instead of 4-7 days



Solutions for rack and roll

- Offsite rack, stack and configuration of equipment such as transport/metro routers, top-of-rack (TOR) switches, panels, fiber guides, compute, storage and more
- Scalable staging and configuration services
- Ability to roll large amounts of equipment to any site
- Specialization includes optical, IP, compute and storage solutions
- Return material authorization (RMA) and supply depot support
- Inventory management with API's to backend financials
- Documentation for as-built rack elevations
- Continuous customer update via workflow systems and tools
- Custom packaging and crating
- Global shipping and logistics



Benefits

- Reduce risk/time/cost/disruption with any deployment
- Lower time required on-site by as much as 60-70 percent
- Accelerate build and installation versus on-site racking
- Minimize packaging and crating on the dock and in/around the cage

Return material authorization (RMA)

For the typical hyperscale or cloud operator, a minute of outage translates to tens and hundreds of thousands of dollars of lost revenue. Many factors go into avoiding downtime, including making sure mean time to repair (MTTR) is as low as possible. That means identifying problem parts quickly, having spares available and rapidly replacing faulty cards and devices.

CommScope's global RMA services team is your central point of contact for question and issues regarding RMA. By taking the lead on maintenance and logistics for failed hardware, we proactively support your production networks—saving you time, money and headaches by constantly improving the hardware replacement process.



Challenges

- Network and service outages lead to lost revenue, prohibitive refund costs and loss of credibility
- Cloud operators typically have limited resourcing to assign to repair/replace
- Thousands of parts: not knowing which might fail; too expensive to store numerous high-ticket spares on site
- Millions of dollars lost in unreturned, warranty-covered parts 'dumped' in the corner of POPs (engineers have better things to do than logistics)
- Unique import/export challenges in difficult countries.



Solutions for RMA

- Central point of RMA contact, coordinating available inventory, access, delivery and consolidation of returns.
- Data reporting to inform decision makers.
- Monitoring of RMA bug queue for new requests and triage as per procedure
- Special procedures and local expertise for "difficult countries"



Benefits

- Faster availability of replacement parts
- Greater visibility to component failure
- Reduce mean time to repair (MTTR)
- Reduce financial exposure
- Recovery of stranded capital

Smart/remote hands

An efficient network operations center (NOC) is the key to maximizing uptime in the face of inevitable outages or failures. Uptime management requires having the proper insight to know when resources are needed on-site, as well as the right systems to support communications, ticketing and management reporting. Finally, you must have a solid approach for handling faulty parts—one that can be adapted to the RMA processes of your various OEMs.

CommScope's smart/remote hands service includes NOC oversight and dispatch of technicians to troubleshoot network issues, isolate faults, perform Root Cause Analysis, replace parts and process RMAs.



Challenges

- Remote/distributed networks with limited personnel
- Staffing for simple dispatch and break/fix services can be challenging
- Direct impact of network uptime on enterprise revenues
- Need for actionable insights on outage severity
- Time and cost of managing multiple, third-party OEM repair and return processes



Solutions for smart/remote hands

- Flexible NOC services: fully outsourced using CommScope facilities or managed within customer NOC
- Eyes-on-glass, ticket monitoring or hybrid queue-based functionality
- Full ticketing system and tools—connects dispatch with CommScope personnel (Smart Hands), customer teams or other vendors
- Smart Hands: dispatches technician on site to troubleshoot failure, replace faulty part
- Simple break/fix: complex outage, fiber cuts and other production impact problems
- RMA management of failed hardware: based on customer/vendor agreements and supports customer hands-on or hands-off involvement
- Global spare tracking for co-locations facilities: specific attention to various parts of integral network infrastructure



Benefits

- Distributed team of high-quality field engineers to help maintain your network
- Having the right systems to support communications and ticketing and management reporting
- The ability to return faulty parts using OEM-specific RMA process.

Decommissioning

Equipment and site decommissioning

Turning up new services often means shutting down old equipment and facilities. Doing so without a structured decommissioning process can disrupt service and have financial consequences. Today's networked organizations must carefully manage how equipment and facilities are removed from service. CommScope's decommissioning services team is staffed by experienced project managers, field technicians, and supply and logistics personnel who can manage the complete lifecycle of equipment removal and facility shutdown. Whether you need to remove and redeploy equipment elsewhere, warehouse it, remarket or recycle it, we help you maximize its value and ensure that your network stays up and running throughout the process.

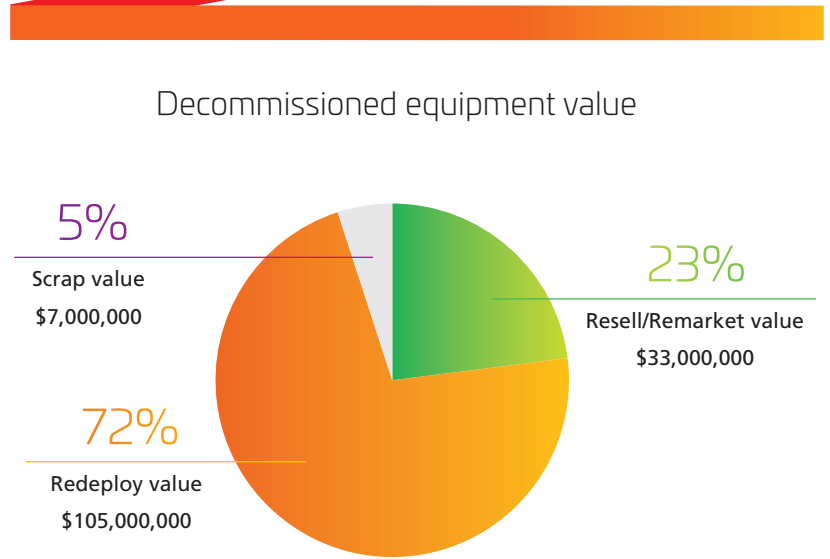


Figure 1: Example of annual decommissioned equipment value for one operator



Challenges

- Understanding replaced assets value
- Determining the worth to reclaim
- Repurposing existing inventory while managing the logistics and maintaining security
- Resources for dedicated teams to efficiently close-out and discontinue services and sites



Solutions for decommissioning

- Plan, schedule, track, and document all decommissioning activities
- Decommission, inventory, packaging and transport of unused network elements
- Wreck-out and disposal (or recycling) of unused cables
- Test, rework and upgrade salvaged network elements and/or stage for redeployment
- Inventory and asset-manage equipment
- Warehouse, label and transport salvaged equipment to customer sites worldwide for redeployment, resale or salvage
- Provide detailed documentation of facility or inventory as needed.



Benefits

- Frees internal resources to focus on core business growth
- Reduces cost by efficiently redeploying, reselling or salvaging decommissioned equipment
- Increases per square-foot value by reusing existing space for more productive use
- Improves accounting accuracy by providing detailed records of assets retained or removed
- Reduces carbon footprint by removing unnecessary items from the waste stream

CommScope: Trusted experts and a powerful partner

Capacity issues in the data center are ongoing and pervasive—especially when it comes to hyperscale and cloud facilities. The ability to create and manage additional optical capacity and white space in the data center is quickly becoming a competitive differentiator. At CommScope, our 40 years of proven experience gives you a definite edge.

Whether it's capacity growth or support for high speed migration, we don't just participate in trends—we pioneer them. With every new improvement to your data center, we are simultaneously readying you for the future. Driven by progress and delivered by experience, CommScope services and solutions for the data center are helping to shape the always-on networks of tomorrow.

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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