



3 THINGS

*You Can Do to Get the **MOST** Out of Your Network Fiber Cables*



A WHITE PAPER

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It always amazes me how often cabling is the last thing we think of in the data center. It's true that on average cabling represents only 3-5% of the overall budget for most data centers, but it's truly one of the most *important* pieces of your infrastructure.

All your servers, storage and switches need to be powered up and connected to the network(s) in order to be productive, which means you need fiber cables running to and from all that equipment. And that used to be EXPENSIVE. Back in the day, a network manager would hire an outside contractor to pull the bulk fiber and fusion splice on the connectors right in front of you. Then, half a day later you'd be up and running – for a price. Nowadays, fiber cables have become more of a commodity and are easier than ever to deploy. In fact, network managers can easily pick up high quality, pre-terminated fiber cables of all varieties with a simple phone call or visit to a web site which makes running fiber cables themselves quicker and more cost effective.

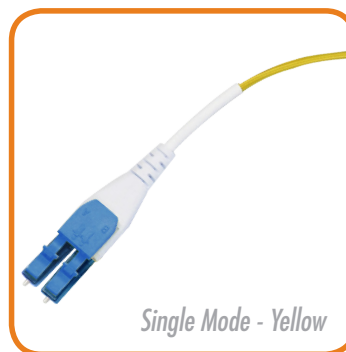
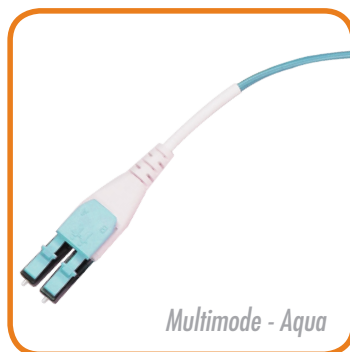
No matter the cost or quality of your cabling infrastructure, it needs to keep your data center up and running smoothly. Here are **three things** you can do to get the most out of your network fiber:

1. CHOOSE The Right Cable For Each Application

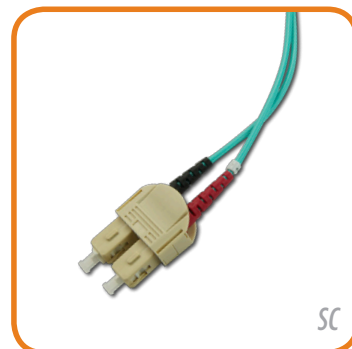
You'll need to know if the connection requires multimode or singlemode fiber, which connectors are needed on both ends, how long it needs to be, etc. And these are just the basics! In truth, there are many options to consider such as fire rating, patch cord vs trunk and polarity type.

Here's a few pointers and hints to help you navigate through the labyrinth of options when selecting the right fiber cable for your needs:

Multimode vs Singlemode – most SAN and Ethernet connections utilize multimode fiber (50 micron) in OM3 or OM4 formats which are aqua colored. Singlemode (9 micron), yellow in color, is usually in the minority in the data center and used for inter-switch links, connections to carrier circuits and "long haul" links. The two types are distinctively different and not compatible with one another so consult your equipment manual to verify what your connection requires.



Connectors — most modern equipment in the data center is using the LC fiber connector which is a small form factor utilizing 2 fibers (a send and a receive). Its older counterpart is the SC connector which can be found on older appliances and is still commonly used in fiber connections between your core network and carrier circuits coming into your building. MTP®/MPO connectors are multi-fiber in nature and often required for 40/100G, Infiniband or other high-bandwidth connections as well as are used for backbone trunking if you utilize a patch panel system (structured cabling) in your environment. There are also other connector styles, albeit less common, such as ST, FC, MTRJ and ESCON. Do your research and make sure you have the right connector type for both ends of the cable — they may need to be different!



Length — This may seem a bit obvious, but consider this: It is better for a cable to be a little long than too short. You can always coil up or route the cable slightly differently to take care of a little slack. But if you're too short, you'll either not be able to make the connection or end up taking "short cuts" straining the fiber cable beyond its specs to make it work! So, measure your cable length needed wisely accounting for any cable tray/managers routing along its path and add in a little extra to be on the safe side. If a standard length in meters will work, you may find it's already made and on-the-shelf at your cable supplier (for fast delivery) versus having to do a custom length and waiting a few days for it to arrive.

Beyond these basics, there are several other options and features for the fiber cable you're choosing. Such as riser vs plenum jackets for fire rating, uniboosts vs zipcord formats, bend insensitivity, insertion loss, ruggedized or armored protection, color coding, etc. Maybe you're running several fiber cables in the same direction in which case pulling a single fiber 'trunk' will save you time (and space) versus pulling a bunch of individual patch cables. This is where relying on a quality fiber cable supplier can pay off as they can help you determine what best fits your needs thru a simple consultation over the phone (or email).

2. **INSTALL** Your Fiber Cables Correctly

I've talked about this at length in other publications but I can't underscore this enough. I've seen too many instances in my experience where a top brand, well made fiber cable was purchased and *INCORRECTLY* installed. Yes, it may still have worked fine when first connected but it later went dark (brought your link down) or started producing bit errors. The fact is that all fiber cables (even mediocre brands) benefit from a well-planned and careful installation in your data center. Here are a few tips:

Cable Management — Use all cable tray/managers available to you along the fiber link path — they're there for that reason. This includes horizontal and vertical cable management in the rack. Minimize the amount of cable you have to route outside of dedicated cable paths. Every server, switch and panel are "expecting" cables to be routed in-n-out of them via a specific path. *Use that path.*

Make Clean Runs — Avoid crossing over other existing cables when running a new fiber cable. This will reduce tangles that might complicate moves, adds, or changes (MAC) down the road.

Don't Hug the Corners — Take gentle bends (avoid sharp turns) and coil up any slack (no less than 8" diameter) on the equipment side versus the switch/director side.

No Clumping — Be careful running fiber cables in basket trays! The weight of other cables piled on top can cause cables on the bottom to get pinched. Use solid bottoms when possible or tie off your bundles in small groupings.

Tread Carefully On Long Runs — For long runs (>100'), I strongly urge using a pulling eye on one side and have the fiber cable installed on a small spool. Request this from your cable supplier. This will protect the connectors and reduce the coiling/twisting effect during your pull.



Identify Your Cables! — Label and document both ends of the cable with appropriate identifiers (source/destination, serial number, length, etc) that allow you to record the cable in your environment. This helps for troubleshooting connections.

Dress Up Your Cables — Dressing your fiber cables with Velcro can be an art form and can really help organize cable bundles, reduce strain, etc. Take the time to show off your good work!

Choose Placement Carefully — Don't put fiber cables in harm's way! Avoid having your fiber cables installed near a pinch point such as cabinet doors, floor tiles or anywhere it can be disturbed/touched in any way.

And last but certainly not least:

3. **MAINTAIN** Your Fiber Cables

Proper maintenance of a fiber cable begins the minute you take it out of the bag! Once you've installed them in your data center, it's pretty much a hands-off until you have MAC's that address those connections. But there are certain best practices you'll want to follow when using new or used fiber cables:

Clean, Clean, Clean – Always clean, inspect and test your fiber connectors before plugging (even brand NEW). End face contamination is the #1 cause of fiber optic link issues. Single-click cleaner pens make cleaning fiber connectors and equipment ports a breeze and should be in each network manager's tool bag. Use a fiber optic scope to inspect the end face to make sure there's no pitting (impacts performance) or fingerprint smears (benefits from wet-to-dry cleaners). Then, use a fiber optic meter (Fluke, etc) to verify the insertion loss is within spec (usually <.25db). If all looks good, then you're clear to plug the fiber cable into the equipment with confidence. Do not simply 'trust' that dust caps have done their job – they protect only so much. ◀



Use Dust Caps Regularly – Those 10¢ plastic dust caps for fiber cables need to be put back on the fiber cables when being uninstalled or reclaimed in your environment. Also, apply dust caps to the equipment ports when you unplug from them... Keep your spare dust caps in a sealed ziplock bag when you take them off installing new fiber cables so they're handy when you need to re-use them down the road.

Remove Old Labels – If you've unplugged a fiber cable in your data center and plan to re-use it down the road, immediately remove any cable labels on it that contain specifics about where it was last attached in your environment. Over the years, I've seen fiber cables re-used that still have an old source/destination identifier on it which will cause a network manager to wear out his shoes trying to track down a cable problem.

I'm reminded of the old saying, "You'll only get out what you put in." It applies generally for a lot of things in life. The same can be said for fiber cabling – it's only as good as the time and attention you put into choosing, installing and maintaining it. Armed with this knowledge and a good relationship with your cabling vendor, you can help maximize your server/application up-time and make sure your fiber infrastructure can support you well in the years to come.

About Total Cable Solutions (TCS)

Total Cable Solutions is a structured cabling company, specializing in complete end-to-end cabling solutions. Our services include: assessment, design and implementation of data center infrastructure, professional project management and 10G, 40G, and 100G connectivity solutions. TCS provides quality products including fiber and copper patch cords and panels, pre-terminated multi-fiber trunk cables, solutions for field termination, custom fiber patch panels and more.

Our ultimate goal is to serve our customers' needs with quality products, ongoing education and professional services with expedited delivery to our OEMs, VARs and distributors. For more information, visit www.TotalCableSolutions.com.

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