

Panduit 40GBASE-SR4 to 10GBASE-SR Solutions

Purpose

The purpose of this document is to describe Panduit solutions that are available to allow a 40GBASE-SR4 transmission signal to be broken down into four discrete 10GBASE-SR transmission signals.

Background

With the development of the 40GBASE-SR4 transceiver, a multi-array (MPO) connector is introduced into an existing 10GBASE-SR infrastructure comprised of duplex LC connectors. The introduction of this new form factor presents an issue when the full 40G transmission signal is not going to be utilized from end to end. In this case, the 40GBASE-SR4 signal needs to be broken down into individual 10GBASE-SR signals to accommodate the existing infrastructure supporting the 10GBASE-SR Top of Rack (ToR) uplinks or 10GBASE-SR capable servers.

Solution

In order to utilize the four individual 10G channels created by the 40G transceiver, a breakout cabling solution or cassette needs to be used. Panduit has developed a breakout harness and a cassette that can easily complete this task while allowing for the utilization of an existing 10G based infrastructure. Both solutions offered duplex the proper 10G TX/RX signals associated with the 40G signal so it can be distributed properly to each 10G transceiver or throughout the rest of the channel. Appendix A shows Day 1 - 10GBASE-SR scenarios and their respective migrations to Day 2 - 40GBASE-SR4 scenarios and the Panduit solutions associated with each.

The breakout harness is constructed with an 8-fiber MPO connection and four pair of duplex LC connectors. This is the jacketed cabling solution shown in Figures 1 and 2 below and is typically used at the switch end of the link where the 10GBASE-SR transceivers are being upgraded to the 40GBASE-SR4 transceivers.

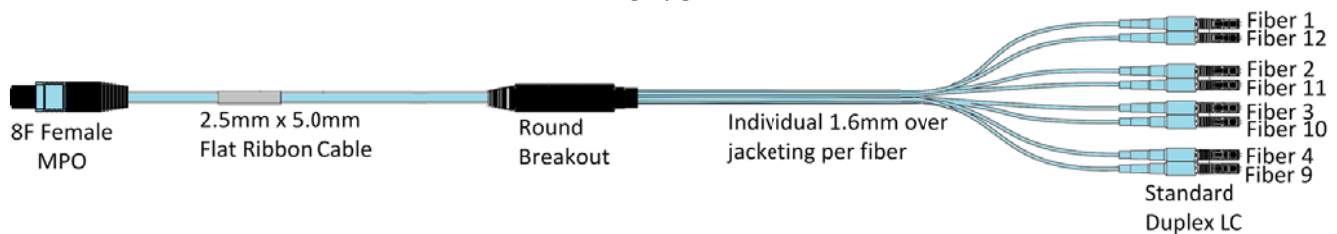


Figure 1. Standard 8F 40G to 10G Migration Harness with Standard Duplex LC construction (Part number: FX8HP6NLSQNM* ; see specification sheet (FBSP56--WW-ENG) for part number information.**

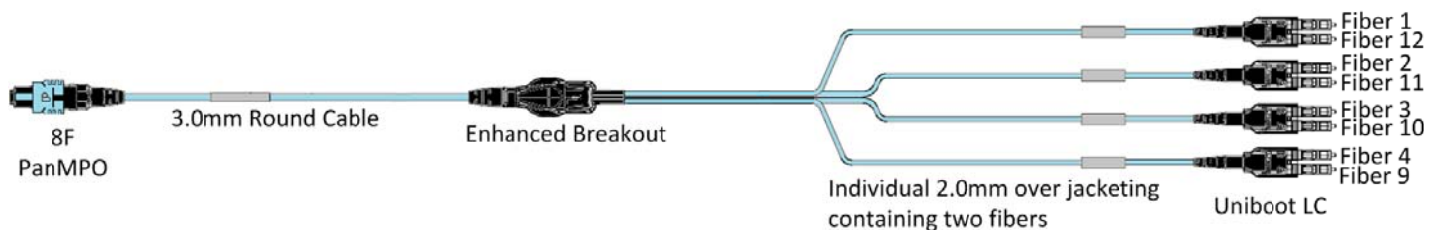


Figure 2. Enhanced 8F 40G to 10G Migration Harness with Uniboot LC construction (Available Q3 2014)

The harness replaces the duplex LC patch cords that run from the 10G transceiver up to a patch panel where it connects to the horizontal cabling infrastructure. The installation of the harness at the switch end of the channel allows for the reuse of the duplex LC infrastructure that was used for the 10G systems as shown in **Figure 3**.

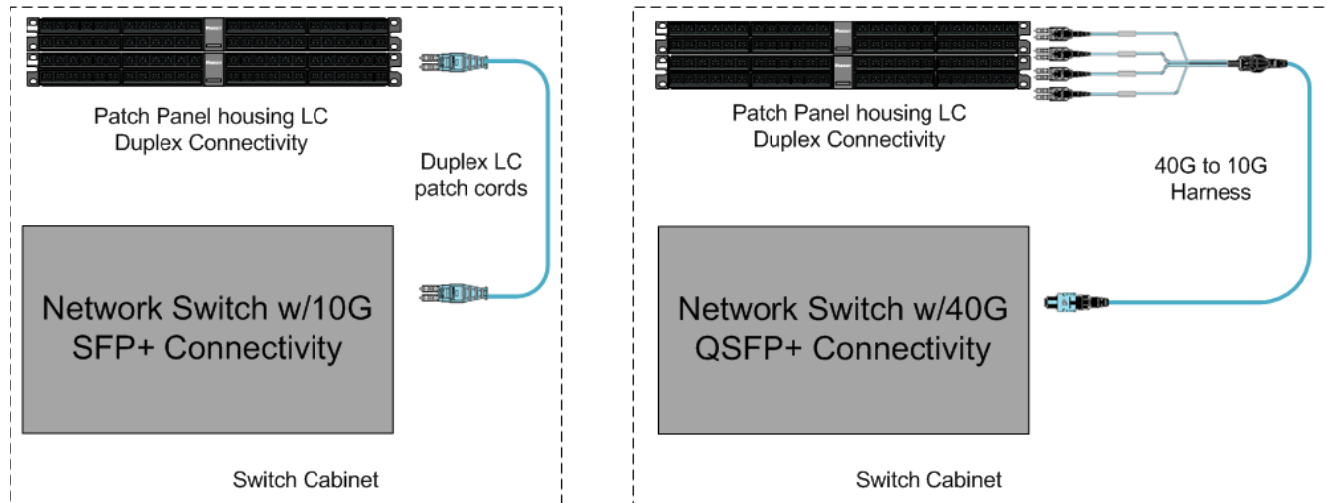


Figure 1. Switch Cabinet Connectivity

Another option is the 40G to 10G cassette. These cassettes come in both the QuickNet SFQ and the QuickNet form factors shown in Figures 4 and 5. These cassettes are typically used at the equipment end of the 40G channel where the 10G signal needs to be broken out to accommodate 10G transceivers installed in the uplinks of a switch or 10G capable servers. They can also be placed in the cross connect area to ensure the 10G signaling is properly distributed throughout the rest of the cabling channel.



Figure 4. QuickNet SFQ 40G to 10G cassette FQ3XN-08-10NM (part number of cassette shown; see specification sheet FBSP86--WW-ENG for part number information.

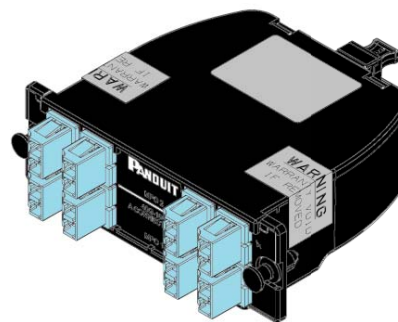


Figure 5. QuickNet 40G to 10G cassette FC3XN-16-10NMBN (part number of cassette shown; see specification sheet FBSP85--WW-ENG for part number information.

The horizontal cabling supports the MPO based 40G transmission up to the migration cassette where the individual duplex LC patch cords are run to the respective 10G targets. Both solutions; the QuickNet form factor cassette, shown in Figure 6 and the QuickNet SFQ form factor cassette are capable of being used to support up to thirty two (32) 10G channels in 1RU of Rackspace. Utilization of the cassette at the equipment end or cross connect field of a typical cabling architecture systems is shown in **Figure 6**.

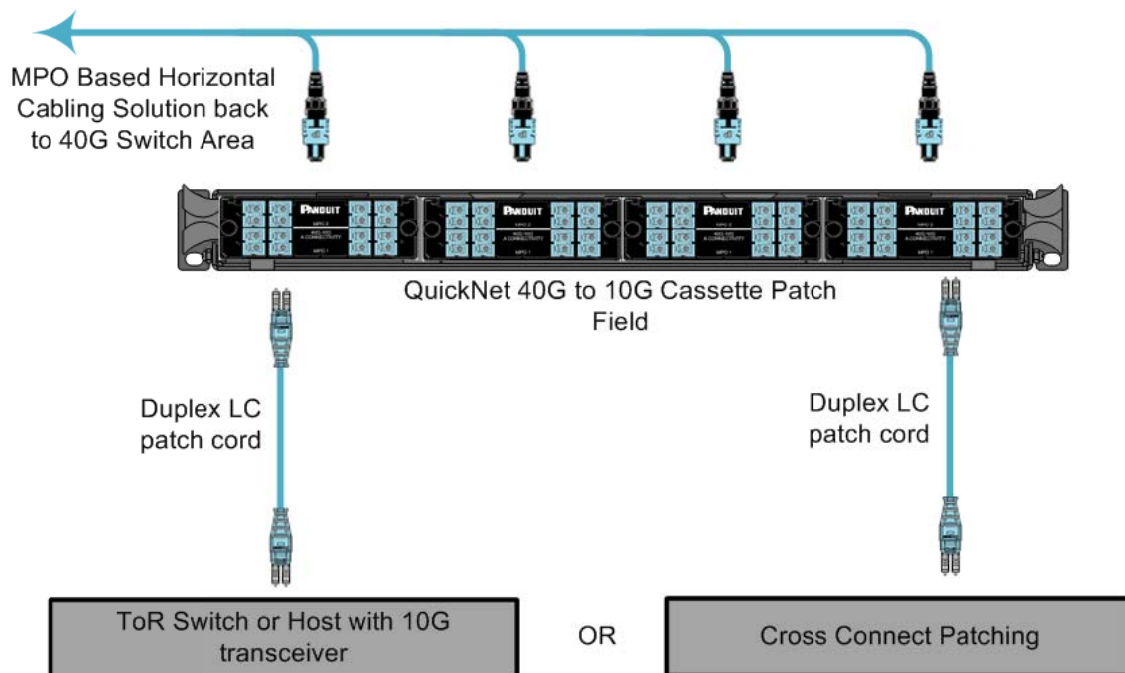


Figure 6. Typical 40G to 10G Cassette utilized in the Equipment Area or in the Cross Connect Field

Summary

With the introduction of the 40G QSFP+ transceiver, the MPO form factor needs to be utilized. With some Top of Rack (ToR) switches and some host bus adapters still operating at 10G and requiring the SFP+ (duplex LC) form factor connectors, Panduit has introduced 40G to 10G jacketed harnesses and cassettes that will easily allow the 40G transmission signal to be transformed into four individual 10G signals.

Appendix A

Scenario 1

This scenario shows a 10G SFP+ channel on Day 1 with standard MPO to LC cassettes utilized in the permanent link and duplex LC patch cords at the ends to connect to the 10G transceivers. On Day 2, when the 10G SFP+ transceiver is upgraded to the 40G SR4 transceiver, the migration harness, shown in Figure 1 or Figure 2, is used to replace the duplex LC patch cord at the switch. The harness used at the switch combines the proper 10G TX/RX signals from the 40G transceiver allowing for the existing cassette based permanent link to be re-used.

Day 1



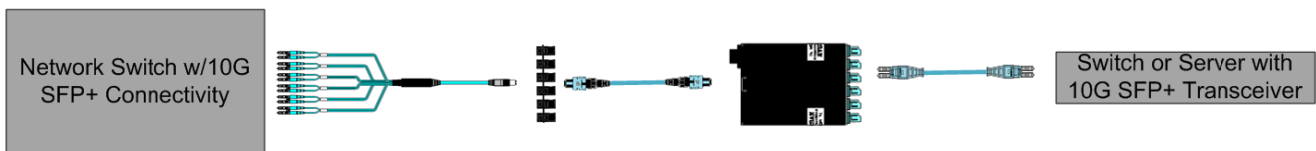
Day 2



Scenario 2

This scenario shows a 10G SFP+ channel on Day 1 with a standard LC to MPO harness connecting the 10G switch ports to the MPO based permanent link and a standard MPO to LC cassette at the far end of the permanent link to represent the Duplex LC needed for the 10G SFP+ transceivers. On Day 2, the harness is replaced with an MPO interconnect to support the 40G SR4 transceiver and the far end cassette is replaced with a 40G to 10G cassette, shown in Figure 3 or 4, to represent the proper TX/RX 10G signals to the 10G transceivers.

Day 1



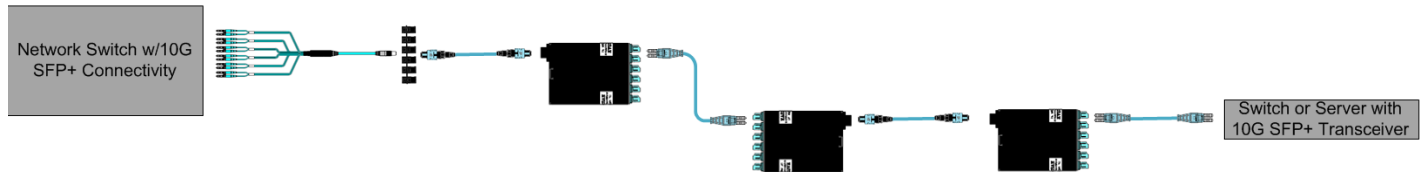
Day 2



Scenario 3

This scenario shows a 10G SFP+ channel Day 1 with a standard LC to MPO harness connecting the 10G switch ports to permanent link and standard cassettes making up the rest of the channel including the cross connect. On Day 2, the harness is replaced with an MPO interconnect to support the 40G SR4 transceiver and the first cassette in the cross connect is replaced with a 40G to 10G cassette, shown in Figure 3 or 4, to represent the proper TX/RX 10G signaling for the 40G signal to be carried through the rest of the channel.

Day 1



Day 2

