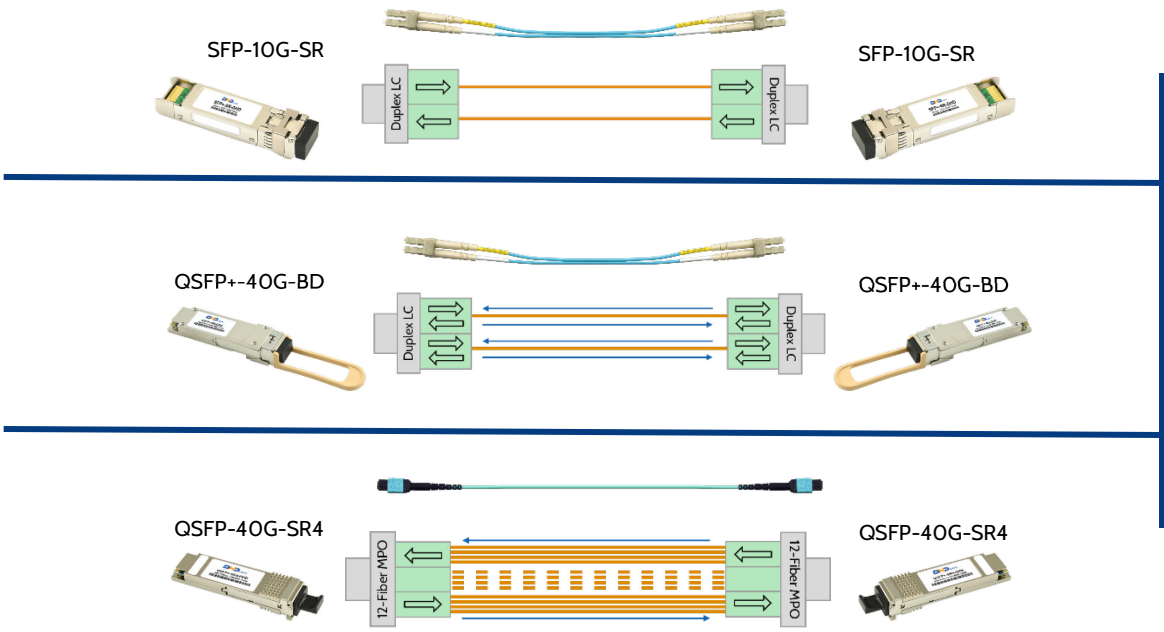
BiDi in the Data Center: What You Need to Know

Bi-Directional technology has finally made its way to the data center. Traditionally known for a being a telecom centric technology, BiDi's innate benefits of cable preservation and increased capacity translate well into data center applications. Before the 40/100GBASE QSFP BiDi, the logical migration path from a 10G link was to go to a standard short reach module (SR4) which utilizes multi-mode fiber with an MPO/MTP connector. This means that operators would have to replace all the pre-existing LC MMF patch cables with MPO MMF cables, add more fibers to the trunks and reconfigure any cable management devices. This can cause all sorts of disruptions and add complication to the upgrade process, not to mention add cost. The QSFP 40/100G BiDi solved this problem by supporting the same 40/100G reach as SR4, but over a single fiber pair. BiDi allows you to increase your bandwidth by 4-10x with the same cabling.

Preserve Existing 10G Cabling with 40G BiDi Optics



"BiDi" means light is traveling in both directions, at the same time, on the same fiber. We do that to get aggregate data rate of 40G or 100G over a single pair of multi-mode fiber.

Key Benefits of the QSFP BiDi

- SIMPLICITY: Repurpose the existing 10G MMF Cable infrastructure – patch cables, patch panels, and fiber trunks. Allows operators to make incremental upgrades from 10G to 40G without the disruption of replacing all the LC MMF cables to MPO MMF (traditionally used for SR4)
- REMOVE COST BARRIERS: QSFP SR4 modules utilize 8-12 fiber strands (MPO/MTP). In a structured cabling environment, operators would have to redesign and theoretically must deploy 4x the amount of fiber in the trunk to upgrade from a 10G to a 40G SR4. This is a significant upgrade to the fiber plant making it expensive and disruptive for customers to migrate.

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Upgrade Path Considerations

Below is a case scenario depicting two migration paths of 296 10G connections to 40G connections. There are some key factors to consider when increasing your bandwidth from 10G to 40G such as material cost, project duration, labor cost, product availability, and downtime. The QSFP BiDi offers a quick fix solution to increase capacity because it doesn't require any new cable investments. This alone mitigates the down time, decreases the project duration because there are no new cable installations, and you don't have to wait for all the other cabling devices to arrive before you upgrade.

Fiber Infrastructure Savings from 10G to 40G Migration

Cost / Savings Comparison Chart		7m	10m	15m
296 LC-connector dual-fiber MMF cables for BiDi		$3,404	$3,996	$5,032
296 MPO-connector ribbon-fiber MMF for SR4		$23,680	$26,640	$63,640
40G BiDi Upgrade Path (10G – 40G)	Total Cost	$0	$0	$0
	Per port savings (US$)	$80	$90	$215
40G SR4 Upgrade Path (10G – 40G)	Total Cost	$23,680	$26,640	$63,640
	Per port savings (US$)	$0	$0	$0

Note: * Optical transceiver not included.
Note: ** These numbers do not factor in any of the installation costs. We've estimated that the additional installation costs of SR4 would double.

DHD 40G BiDi

- QSFP+ form factor
- Link distances of 100m OM3 and 150m OM4
- Dual wavelength VCSEL bi-directional optical interface. 2x20Gbps 850nm/900nm
- Compliant to QSFP+ SFF-8436 specification

DHD 100G BiDi

- QSFP28 form factor
- Link distances of 70m OM3, 100m OM4 and 150m OM5
- Dual wavelength VCSEL bi-directional optical interface. PAM4 2x50Gbps 850nm/900nm
- Compliant to QSFP28 MSA SFF-8636 specification

OEM-Equivalent Part Guide

ITNet Supply Part Number	Cisco	Arista	Brocade
QSFP28-BD-DHD	QSFP-40/100-SRBD	QSFP-100G-SRBD	*Custom Solution
QSFP+-BD-DHD	QSFP-40G-SR-BD	QSFP-40G-SRBD	40G-QSFP-SR-BIDI

DHD now has 40G and 100G BiDi available in stock. For any product inquiries, please contact your DHD sales rep.

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