Certified by:

BROCADE

16/8/4 Gbps
FIBRE CHANNEL
SOLUTIONS

BROCADE CERTIFIED SAN EXTENSION SOLUTIONS

INTRODUCTION

Smartoptics is proud to be the leading supplier of SAN extension solutions based on optical WDM (Wavelength Division Multiplexing) technology. We are the only vendor approved in all the latest Brocade (and Brocade OEMed) FC switches and offer solutions for all requirements from single channel up to multiple DWDM wavelength channels. The chart on the reverse side covers the solutions approved by Brocade whereas the complete Smartoptics portfolio covers higher channel count systems, single fibre connectivity and all Ethernet transmission.

DEFINITIONS

SINGLE CHANNEL CONNECTIVITY

This is where a single channel transceiver (commonly referred to as ELWL [extra-long wavelength], LR, ER, ZR) is connected directly between the Fibre Channel switch and line fibre. The advantage is that it provides connectivity up to 100km (4Gbps), 70km (8&10Gbps), 40km (16Gbps), but the disadvantage is that no other traffic can be transported through the fibre.

PASSIVE WDM NETWORKING

Natural progression from single channel connectivity. Allows up to 80 channels of FC and/or Ethernet traffic to be connected together over the same fibre. Smartoptics Brocade Certified CWDM or DWDM transceivers reside directly in the Switch and connected via an LC patch cord to a completely non-powered (Passive) CWDM or DWDM mux/demux. Extremely cost effective for short to mid-range distances and provides the ultimate green data centre solution.

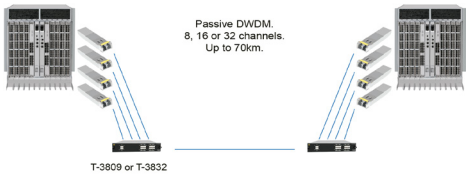
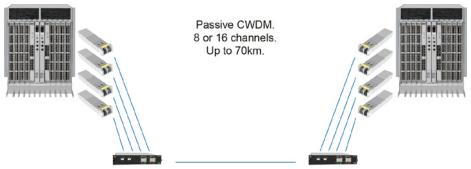
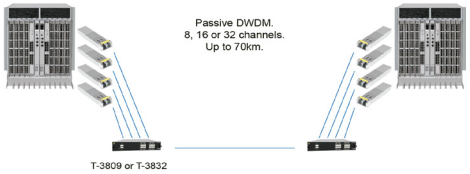
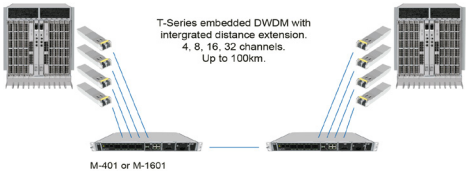
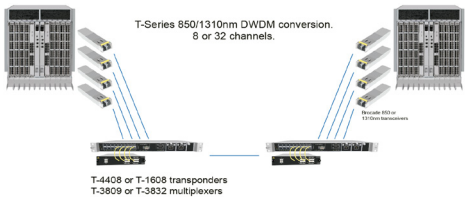
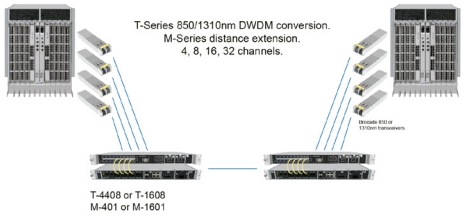
ACTIVE WDM NETWORKING

WDM products (also known as Transponders or Muxponders) that are AC or DC powered devices with GUI management. For a solution to be called “Active” it usually has an OEO conversion (Optical to Electrical to Optical) to generate a clean signal that can be amplified if longer transmission distances are required. Active products are also commonly used for media conversion from 850/1310nm coming from the switch to CWDM or DWDM wavelengths. They have SFP+ or XFP interfaces to house a Smartoptics 850nm/1310nm transceiver which accepts the corresponding client 850/1310nm connection from the FC/Ethernet switches. They also have SFP+ or XFP interfaces that face the network side as well. These network side interfaces can house Smartoptics CWDM or DWDM transceivers and interface passive CWDM, DWDM muxes or M-401, M-1601 semi-passive multiplexers.

SEMI-PASSIVE WDM NETWORKING

Smartoptics M-Series family is the only platform of its kind in the industry to have this “Semi-passive” designation and Smartoptics has coined the phrase. The modules are all 1U and consist of an intelligent multiplexer which combines the simplicity of a passive multiplexer with the key features of a traditional active wdm system. Integrated line conditioning features, amplifiers, tunable dispersion compensation, variable optical attenuation and optical monitoring enable any combination of Ethernet and/or FC traffic to be transmitted up to 200km whilst allowing customers to monitor key network diagnostic parameters such as transmission light levels. This is all done without the need for OEO conversion so even though the M-Series is powered it is technically not an “Active” DWDM platform. The M-Series follows the same approach as Passive wdm networking in that the Smartoptics DWDM transceivers reside in the FC/Ethernet switch.

smartoptics

Application description	Type	Channels	Data rate	Km	Transceiver part number	Multiplexer part number	Min SW rev	Supported Brocade switches and directors	Example network diagram
Direct connect to FC switch for single channel connectivity	ELWL	1	4Gps	50	SO-SFP-4GFC-L50D	Not applicable	FOS 6.2.0c	200E, 300, 400, 4900, 5000, 5100,5300, 7500, 7500E, 48K, 48K (a) / FC4-181 / FC4-48 / FC161P, DCX/DCX-4S Backbone	
				80	SO-SFP-4GFC-80D-C55	Not applicable			
				100	SO-SFP-4GFC-L100D	Not applicable			
			8Gbps	40	8G-ER-Dxxx-BR1	Not applicable	FOS 7.1.1	FC8-xx(FC8-16, FC8-32, FC8-48),FX8-24 blades in DCX and DCX-4S, FC8-xx(FC8-32E, FC8-48E), FX8-24, FC16-xx(FC16-32, FC16-48) blades in DCX 8510-8, 300, 5100, 5300, 6505, 6510, 6520, 7800	
				70	8G-ZR-Cxx-BR1	Not applicable	FOS 7.3.0b		
			16Gbps	40	16G-ER-Dxxx-BR1	Not applicable	FOS 7.3.1	FC16-xx (FC16-32, FC16-48) blades in DCX 8510-8, 6505, 6510, 6520	
CWDM (Passive) (1470nm to 1610nm) (1290nm to 1610nm)	CWDM	8	4Gbps	50	SO-SFP-4GFC-50D-Cxx	T-3008 or T-3009	FOS 6.2.0c	200E, 300, 400, 4900, 5000, 5100, 5300, 7500, 7500E, 48K, 48K (a) / FC4-181 / FC4-48 / FC161P, DCX/DCX-4S Backbone	
		16	4Gbps	50	SO-SFP-4GFC-50D-Cxx	T-3008 & T-3009			
		8	4Gbps	80	SO-SFP-4GFC-80D-Cxx	T-3008 or T-3009			
		8	8Gbps	40	SO-SFP-8GFC-40D-Cxx	T-3009-LC-40	FOS 6.3.0		
		16	8Gbps	40	SO-SFP-8GFC-40D-Cxx	T-3009-LC-40, T-3016	FOS 6.3.0		
		8	8Gbps	70	8G-ZR-Cxx-BR1	T-3008 or T-3009	FOS 7.3.0b	FC8-xx(FC8-16, FC8-32, FC8-48),FX8-24 blades in DCX and DCX-4S, FC8-xx(FC8-32E, FC8-48E), FX8-24, FC16-xx(FC16-32, FC16-48) blades in DCX 8510-8, 300, 5100, 5300, 6505, 6510, 6520, 7800	
		2	16Gbps	25	16G-ER-Dxxx-BR1	T-3008 or T-3009	FOS 7.3.1	FC16-xx (FC16-32, FC16-48) blades in DCX 8510-8, 6505, 6510, 6520	
		2	16Gbps	25	16G-ER-Dxxx-BR1	T-3008 or T-3009	FOS 7.3.1		
DWDM (Passive) 40 channels 1530.33nm to 1560.61	DWDM	8	4Gbps	80	SO-SFP-4GFC-80D-Dxxxx	T-3809	FOS 6.3.0	200E, 300, 400, 4900, 5000, 5100, 5300, 7500, 7500E, 48K, 48K (a) / FC4-181 / FC4-48 / FC161P, DCX/DCX-4S Backbone	
		32	4Gbps	80	SO-SFP-4GFC-80D-Dxxxx	T-3832			
		8	8Gbps	40	8G-ER-Dxxx-BR1	T-3809	FOS 7.1.1	FC8-xx(FC8-16, FC8-32, FC8-48),FX8-24 blades in DCX and DCX-4S, FC8-xx(FC8-32E, FC8-48E), FX8-24, FC16-xx(FC16-32, FC16-48) blades in DCX 8510-8, 300, 5100, 5300, 6505, 6510, 6520, 7800	
		32	8Gbps	40	8G-ER-Dxxx-BR1	T-3832			
		8	16Gbps	25	16G-ER-Dxxx-BR1	T-3809	FOS 7.3.1	FC16-xx (FC16-32, FC16-48) blades in DCX 8510-8, 6505, 6510, 6520	
		32	16Gbps	25	16G-ER-Dxxx-BR1	T-3832			
DWDM (Semi-Passive) embedded DWDM with distance extension 1530.33nm to 1560.61	DWDM	4	8Gbps	<200	8G-ER-Dxxx-BR1	M-401	FOS 7.1.1	FC8-xx(FC8-16, FC8-32, FC8-48),FX8-24 blades in DCX and DCX-4S, FC8-xx(FC8-32E, FC8-48E), FX8-24, FC16-xx(FC16-32, FC16-48) blades in DCX 8510-8, 300, 5100, 5300, 6505, 6510, 6520, 7800	
		8	8Gbps	<200	8G-ER-Dxxx-BR1	M-401 & M-400			
		16	8Gbps	<200	8G-ER-Dxxx-BR1	M-1601			
		32	8Gbps	<200	8G-ER-Dxxx-BR1	M-1601 & M-1600			
		16	16Gbps	<200	16G-ER-Dxxx-BR1	M-1601	FOS 7.3.1	FC16-xx (FC16-32, FC16-48) blades in DCX 8510-8, 6505, 6510, 6520	
		32	16Gbps	<200	16G-ER-Dxxx-BR1	M-1601 & M-1600			
DWDM (Active) 850nm/1310nm to DWDM conversion with passive muxes. Use 850/1310nm in client equipment. T-4408 or T-1608 are used to convert FC to CWDM or DWDM Smartoptics transceivers reside in T-Series mux.	DWDM	8	4Gbps	80	SO-SFP-4GFC-80D-Dxxxx	T-3809, T-4408	N/A	FC8-xx(FC8-16, FC8-32, FC8-48),FX8-24 blades in DCX and DCX-4S, FC8-xx(FC8-32E, FC8-48E), FX8-24, FC16-xx(FC16-32, FC16-48) blades in DCX 8510-8, 300, 5100, 5300, 6505, 6510, 6520, 7800	
		32	4Gbps	80	SO-SFP-4GFC-80D-Dxxxx	T-3832, T-4408			
		8	8Gbps	40	8G-ER-Dxxx-BR1	T-3809, T-1608			
		32	8Gbps	40	8G-ER-Dxxx-BR1	T-3832, T-1608			
		8	16Gbps	25	SO-SFP-16GFC-ER-Dxxxx	T-3809, T-1608			
		32	16Gbps	25	SO-SFP-16GFC-ER-Dxxxx	T-3832, T-1608			
DWDM (Active) 850nm/1310nm to DWDM conversion with M-Series distance extension use 850/1310nm in client equipment. T-4408 or T-1608 are used to convert FC to DWDM M-401 or M-1601 provide distance extension.	DWDM	4	4Gbps	<200	8G-ER-Dxxx-BR1	T-1608, M-401	N/A	FC8-xx(FC8-16, FC8-32, FC8-48),FX8-24 blades in DCX and DCX-4S, FC8-xx(FC8-32E, FC8-48E), FX8-24, FC16-xx(FC16-32, FC16-48) blades in DCX 8510-8, 300, 5100, 5300, 6505, 6510, 6520, 7800	
		8	4Gbps	<200	8G-ER-Dxxx-BR1	T-1608, M-401 & M-400			
		16	8Gbps	<200	8G-ER-Dxxx-BR1	T-1608, M-1601			
		32	8Gbps	<200	8G-ER-Dxxx-BR1	T-1608, M-1601 & M-1600			
		16	16Gbps	<200	SO-SFP-16GFC-ER-Dxxxx	T-1608, M-4000, M-1601			
		32	16Gbps	<200	SO-SFP-16GFC-ER-Dxxxx	T-1608, M-4000,, M-1601 & M-160			

smartoptics