maXtap™

High-Density Network Taps

Features…

- *Offers low-insertion loss with flexible tap ratios*
- *Provides as many as 32/64 duplex/simplex taps per chassis using LC adapters or 192 using MPO/MTP adapters*
- *Acquires all data non-intrusively for monitoring*
- *Eliminates the possibility of losing traffic due to backplane congestion on L2/3 SPAN ports*
- *Enables application flexibility with removable modules*

Benefits…

- *Provides a true pay-as-you-grow model*
- *Reduces space while increasing capacity – highest available*
- *Mirrors traffic without impacting performance*
- *Prevents "blind" spots from occurring when monitoring*
- *Allows for expansion to accommodate more taps or different modules*

Monitor More with Less

Using maXtap[tm]'s network tap modules allows data centers, service providers, and large enterprises to non-intrusively monitor more traffic in the smallest footprint available. Traditionally, L2/3 switch routers use Switched Port ANalyzer (SPAN) ports to monitor traffic. When a malicious cyberattack occurs such as a Distributed Denial of Service (DDoS) attack, congestion occurs on the L2/3 devices backplane. When congestion is encountered the L2/3 device frequently reacts by dropping all SPAN port traffic leaving you "blind" with no accessible visibility into the attack. One of the best and least expensive ways to guarantee this does not happen is to use a passive optical network tap, such as the maXtap[tm] to increase network visibility and eliminate critical packet loss.

Flexibility to Meet Your Needs

Taps can be ordered with power split ratios of 50:50 up to 99:1. 50:50 taps split the optical signal symmetrically while 99:1 taps are asymmetric and only tap 1% of the light on the network. In addition, our tap modules can be configured for unidirectional or bidirectional taps. So, you can tap up to 192 fibers carrying 1/10/40/100+Gbps single mode fiber traffic in a single chassis.

For 40/100G bidirectional multimode fiber taps, we can provide two 40G or one 100G tap per module using MTP-24s for a total of 32/16.

** see next page for more information regarding module capacity*

www.optix2.com 844-250-7074 sales@optix2.com

OptiX^2 Universal Chassis

The OptiX^2 universal chassis provides the most versatility and density within a single rack unit of any available platform. Capable of holding 16 modules, the chassis comes with 19” and 23” rack mount brackets and is OptiX^2’s universal platform for all passive optical modules such as maXimux®, OmniPON^{tm}, maXpatch^{tm}, and maXtap^{tm}.

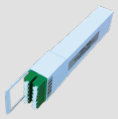
To order the Universal Chassis use the following part number: OPTX-UC-1923-PW.

OptiX^2 Universal Chassis Fiber Management Shelf

The OptiX^2 universal chassis fiber management shelf provides fiber management for all available modules for the OptiX^2 universal chassis. The shelf is easy to install with a bracket that is made to fit over the universal chassis’ bracket. It comes with fiber management clips for securing fibers to the chassis and a removable front door with an adhesive label for module identification.

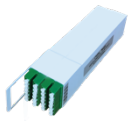
To order the Fiber Management Shelf use the following part number: OPTX-FM-1923-PW.

maXtap[tm] Modules and Capacities



Single-Width LC

Houses up to 4-1x2 (2 duplex or 4 simplex taps) fiber optic splitters/couplers using LC adapters. Maximum capacity with MPO/MTP-12 adapters is 12 fiber optic splitters/couplers (6 taps). Can be ordered with up to 12 LC adapters or 3 MPO/MTP-12/24 adapters. The maximum capacity for 40G multimode bidirectional taps is 2 and for 100G multimode bidirectional taps is 1.



Dual-Width MPO/MTP

Houses up to 8 fiber optic splitters/couplers (4 duplex or 8 simplex taps) using LC adapters. Maximum capacity with MPO/MTP-24 adapters is 24 fiber optic splitters/couplers (12 taps). Can be ordered with up to 24 LC adapters or 3 MPO/MTP-24 adapters or 6 MPO/MTP-12 adapters. The maximum capacity for 40G multimode bidirectional taps is 4 and for 100G multimode bidirectional taps is 2 for 10x10G or 4 for 4x25G.

maXtap[tm] Coupler/Splitter Technical Specifications

PARAMETER	SPECIFICATION		
Operating Wavelength (nm)	Dual window (1310/1550nm for SMF and 850/1300nm for MMF)		
Type	1x2 (add 0.3dB for MMF)	1x3 (add 0.5dB for MMF)	2x2 (add 0.5dB for MMF)
Insertion Loss (dB) Max.*	≤3.6[1] or ≤1.9 / ≤6.0[1] @ 70:30[2]	≤3.7[1] or ≤.7[1] / 7.6[1] @ 50:25:25[2]	≤3.8[1] / ≤4.8[1]
Uniformity (dB) Max.*	≤0.6 / ≤0.8	≤0.8 / ≤1.0	≤0.6 / ≤0.8
PDL (dB) Max.*	≤0.2 / ≤0.4	≤0.2 / ≤0.4	≤0.2 / ≤0.4
Directivity (dB) Min*	55		
Return Loss (dB) Max*	55 APC / 50 UPC		
Operating Temperature (°C)	-40~+85		
Storage Temperature (°C)	-40~+85		
Fiber Length	1m or custom length		
Fiber Type	Corning SMF-28e Fiber / OM2-50 MMF (OM3/4/5 may deviate by +/-)		
Connector Type	Customer Specified		
Power Handling (mW)	300		

[1]Includes LC connector loss. Add 0.2dB additional loss for MPO/MTP connectors.
[2]Contact sales for other split ratios such as 80:20 or 90:10.

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Example Module Configurations

OPTIX² maXtap™			# OF TAPS SUPPORTED BY APPLICATION					
MODULE CONFIGURATION GUIDE			1x2		1x3		2x2	
Module Type	Adap. Type	# of Adap.	Simplex	Duplex	Simplex	Duplex	Simplex	Duplex
Single	LC	12	4	2	3	1	3	1
	SC	6	2	1	1	N/A	1	N/A
	MPO 12/24	3	12/24	6/12	9/18	4/9	6/12	3/6

Ordering Guide for maXtap^{tm} Modules

BRAND	MODEL	FIBER	SPLIT	QTY	POWER RATIO	IN ADAPTER	OUT ADAPTER
OPTX-	MXT-	XN-	XX	XX	XX-	X	X
		Multimode=MN N=M3,M4,M5 (OM3/4/5) Single mode=S	1x2=12	1=01	95:5=95[1]	LCA=C	LCA=C
			1x3=13	2=02	90:10=90[1]	LCU=D	LCU=D
			1x4=14	3=03	80:20=80[1]	SCA=E**	SCA=E**
			1x8=18	4=04	70:30=70[1]	SCU=F**	SCU=F**
			2x2=22	8=08	60:40=60[1]	MTP=M	MTP=M
				10=10	Even=50	Other=X	Other=X
				12=12			
				16=16			
				20=20			
				24=24			

Note: If 1x3s are used then the power ratio refers to the network side only. The monitor side will divide the remaining power equally. For example a 50 would be 50:25:25.

Example Order

An example of an order for a 4-1x2 single mode fiber coupler/splitter with an even power split ratio, LC APC input/output adapter, and an LC APC COM adapter (OPTX-MXT-S-120470CC) is shown below:

OPTX-MXT-	X-	XX-	XX	XX	X	X
OPTX-MXT-	S	12	04	70	C	C

Networking Monitoring with maXtap^{tm}

Network Monitoring – Today's networks are under constant threat of attack. Cyberattacks have become an all too common occurrence. Whether the monitoring entity is looking for Distributed Denial of Service (DDoS) or other attacks, it is imperative that they receive an exact replica of the data on the network. Typical switches and routers usually have Switched Port Analyzer (SPAN) ports; however, they are generally ill-equipped for this function. For example, a DDoS attack is designed to flood a device with traffic coming from seemingly multiple sources until the device experiences so much traffic congestion that it fails. Unfortunately, most SPAN ports are designed to stop forwarding traffic when the backplane becomes congested. So, at the very moment the SPAN port is most needed it isn't even functioning.

Even newer switches that claim to provide line rate monitoring with no packet loss and bypass switch functionality, can cause issues. Putting such active devices (devices that require power) on the backbone of a network increases the potential for network outages, interoperability issues, and higher network costs.

On the other hand, optical taps, which operate solely at the physical layer, collect all traffic no matter how congested the network gets and are completely passive (requires no power), which makes them ideal for collecting malicious traffic. In the example below, the maXtap^{tm} is shown tapping a backbone fiber. An exact copy of the traffic is forwarded to an aggregation/filter switch, which filters out the unwanted packet types and aggregates the packets that need further examination. Then, these packets are sent to a data scrubbing server where possible threats can be analyzed.

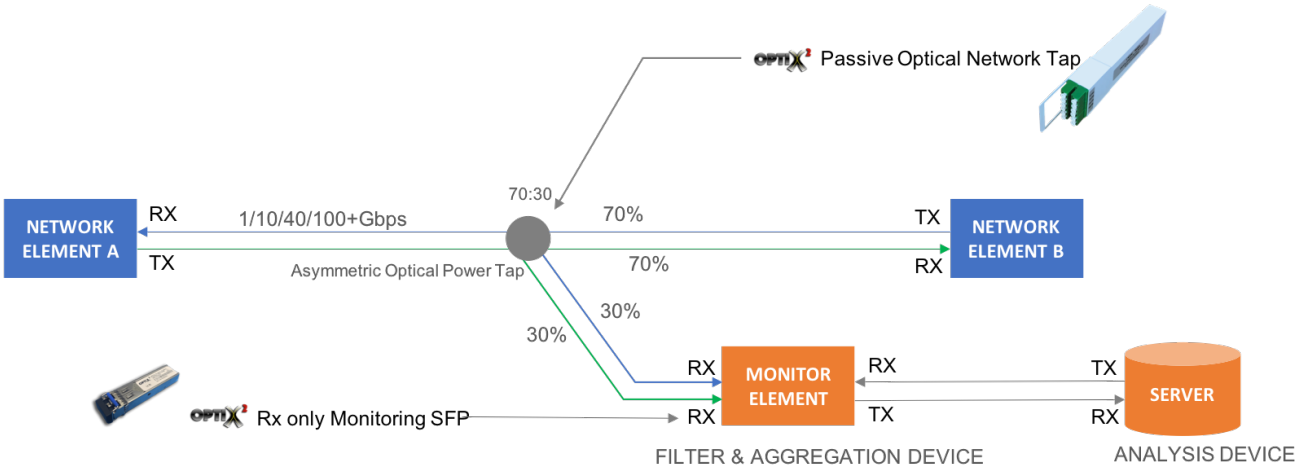

Figure 1: maXtap^{tm} Network Architecture