NetBlazer version 2.2

Next-Gen

Fibre Channel

1000

VoIP Copper Testing

;|3G≥fie|

Next-Gen SOTN SCopper Testing

Customer Presentation

QoE

nce

ssuran

Gary Macknofsky: Product Line Manager

July/2014





Agenda

1 Introduction

- 2 New features in Release 2.2
- 3 EXFO TFv
- 4 Conclusion

FTB-1 PLATFORM

THE FIELD TECH'S CHOICE

EXFO

FTB-1: Portability and Flexibility

ONBOARD UTILITIES













Bluetooth Data Mover

Update Manager

Wi-Fi Wizard

Internet Explorer

Remote control

EXFO Connect

ONBOARD TEST TOOLS















Expert IPTV

EXpert IP

EXpert VolP

Wireshark

Net Stumbler

Jperf

UNMATCHED CONNECTIVITY









NetBlazer



IT'S YOUR CHOICE



FTB-810

Dedicated Transport Tester DSn/PDH ISDN PRI OC 48/STM 16

FTB-810G



Dedicated Transport Tester DSn/PDH ISDN PRI OC 192/STM 64 Multiservice Tester Sonet/SDH/OTN 10M to 10G Fibre Channel: 1, 2, 4, 8, 10x SyncE/1588 CPRI/OBSAI

FTB-880



Multiservice Tester SONET/SDH/OTN DSn/PDH/ISDN 10M to 10G Fibre Channel: 1, 2, 4, 8, 10x SyncE/1588 CPRI/OBSAI

FTB-860G



10M to 10G Fibre Channel: 1, 2, 4, 8, 10x SyncE/1588 CPRI/OBSAI

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FTB-860GL

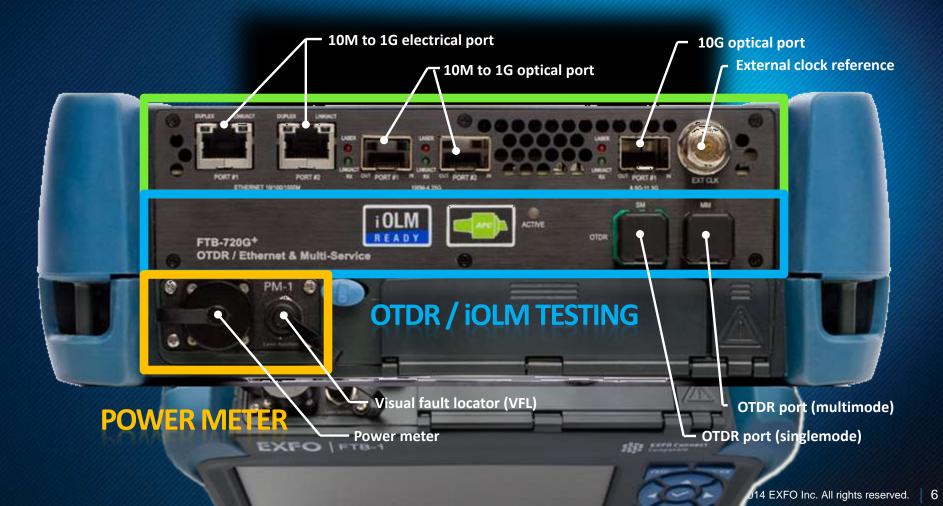
10M to 10G Loopback only

FTB-860

Multiservice Tester Fibre Channel: 1, 2, 4x SyncE/1588 CPRI/OBSAI

One Solution – FTB-700G Series

COMBINING OPTICAL AND MULTISERVICE PROTOCOL TESTING



FTB-700G SERIES

WHY WAS THIS PRODUCT CREATED?



FIP-430B Fiber Inspection Probe

Connect max 2

Automated pass/fail connector analyzer One-touch results in <4 seconds Full reports Compatible with EXFO's <u>FIP-400B inspection probe</u>

i OLM intelligent Optical Link Mapper

No training required: self-setting device

No trace misinterpretation thanks to a clear schematic link view Link-Aware[™] delivers simple, accurate fiber-optic link test results Prompt diagnosis for quick, accurate identification of network issues

SEtherSAM

SLA validation in a single test Simultaneous bidirectional testing Standards-based (ITU-T Y.1564)

EXFO Connect

Make your data mean business

- Automation and business intelligence
- Cloud-based equipment and test data management

FTB Anywhere[™] Floating Test Licenses

> BUDGET FLEXIBILITY

- Available anywhere, anytime and to anyone
- > Eliminates the barrier to field-testing efficiency
- > Feature-rich solution











Agenda

- 1 Introduction
- **2** New features in Release 2.2
- 3 EXFO TFv
- 4 Conclusion

TIDAL WAVE OF FEATURES

SS SNULTPATTERU SS SNULTPATTERUCY SS SNULTPATTERUCY SS SNULTPATTERUCY

West Shancen CED FILTERS

ROWER CAPTURE OPACIES ETHERNET OAM OPACE THERNET OAM OPACE THERNET OAM OPACE THERNET OAM

N NEW REPORTS

Various FREE Upgrades

Other Enhancements

Favorites



Other Enhancements

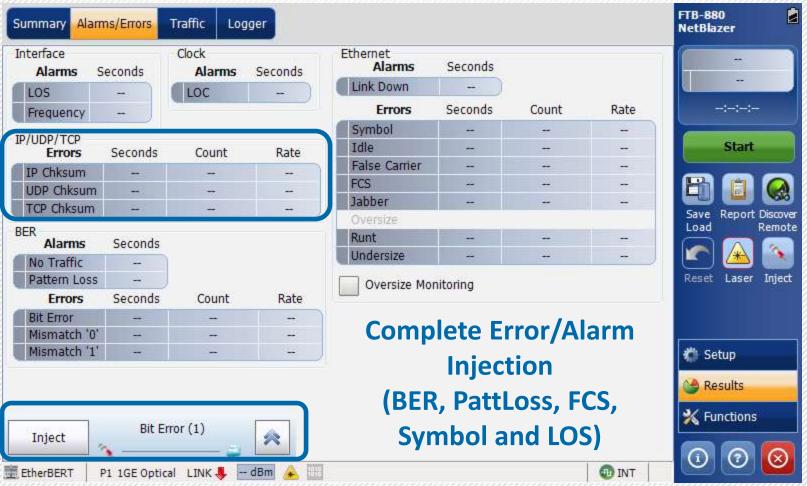
More Ethernet Statistics

FTB-880 Alarms/Errors Traffic Summary Logger NetBlazer Clock Interface Ethernet Alarms Seconds Seconds Alarms Seconds Alarms Link Down LOC LOS ---Errors Seconds Count Rate Frequency ---Symbol -IP/UDP/TCP Start Idle ------Errors Seconds Rate Count False Carrier ----**IP** Chksum -FCS ----4 **UDP** Chksum -Jabber TCP Chksum ----Report Discover Save Load Remote BER Runt ---Alarms Seconds Undersize ----No Traffic -Pattern Loss Reset Laser Inject **Oversize Monitoring** Errors Seconds Count Rate Bit Error --**Complete Error/Alarm** Mismatch '0' ------Mismatch '1' 🁛 Setup -1 -Injection A Results (BER, PattLoss, FCS, **%** Functions Bit Error (1) Symbol & LOS) Inject \approx \otimes i (?)1NT P1 1GE Optical LINK 🖊 -- dBm EtherBERT

In load 2.0

Other Enhancements

More Ethernet Statistics



Baftere

Frequency Offset

Ability to modify the frequency offset up to +/- 120 ppm

冠 ftb1-646206 - TightVNC Viewer	
Test Applications Test Configurator Timer System	FTB-880 NetBlazer
Port 1 - 1GE Optical	PASS
LINK	
Auto-Negotiation Duplex Full Duplex Full Duplex	0d:00:00:11
Flow Control None None	Start
Physical Interface	
Laser TX Power (dBm) Wavelength (nm) RX Power (dBm) Min RX Power (dBm) Max RX Power (dBm)	1
ON🗻 -5.5 850 nm -5.9 -5.9 -5.9	Save Report Discover Load Remote
Laser OFF at Start-Up Power Range (dBm) -18.0 To -1.0	
TX Frequency RX Frequency	Reset Laser
Frequency (MHz) 1250.138750 Frequency (MHz) Offset (ppm) Max Offset (ppm)	
Offset (ppm) - 111.0 + Negative Positive	
Step Size (ppm) 1.0	🎯 Setup
	A Results
	K Functions
Interface Network SFP/SFP+	
Traffic Gen & Mon P1 1GE Optical LINK 😭 -5.9 dBm 🗻 💦 🕕 🕕	000

Report Generation

Test Reports

The Past Does Not Equal the Future!

Test Results

Start Time	11:26		
Duration	0d 00:00:34		
Test Status	Completed		
Pass/Fail Verdict	Fail		
RX Rate(Mbit/s)	100.000		
BER			
BER Pass/Fail Verdict	Fail		
Bit Error	Count	Rate	
Total	1	6.5E-09	
Mismatch'0'	1	6.5E-09	
Mismatch'1'	0	0.0E00	
Service Disruption			
SDT Pass/Fail Verdict	Pass		

EtherBERT_2014_01_17_11_27_30.pdf

Bert Test 100Mbps

Longest SDT (ms) Shortest SDT (ms) Last SDT (ms) Average SDT (ms) Total SDT (s) Service Disruption Count IP Address: UDP Port: Destination: MAC Address IP Address UDP Port:	0 0 0 0	10.10.10.2 7 00:03:01:FD:A4:F4 10.10.10.2 49184
UDP Port: Remote ID		49184 Disabled

Results Summary





Alarms/Errors

Alarms/Errors List	
Active/Historical Alarms/Errors	

Bit Error, Mismatch '1'

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Before

New Traffic Generation

Now with 16 Streams and Per-Stream Statistics!

Activity free funds so find the cov

eadmentinge!

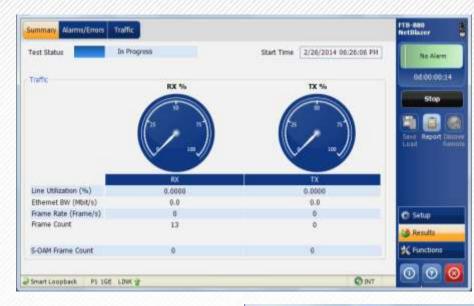
Stream	TX Rate (%)			te (%)		
		Current	Average	Minimum	Maximum	No Alarm
1	0.0126	0.0126 🥑	0.0126	0.0126	0.0126	0d:00:02:2
2	1.0000	0.5357	0.9922	0.1357	1.9358	00:00:02:2
3	0.3972	0.3970 🥑	0.3972	0.3970	0.3981	Chan
4	10.0000	9.9999 🥑	10.0000	9.9998	10.0001	Stop
5	8.0000	8.0000 🥑	8.0000	7.9998	8.0000	
6	15.0000	14.9999 🥑	14.9999	14.9998	15.0001	
7	20.0000	19.9999 🥑	20.0000	19.9997	20.0002	Save Report Di
8	5.0000	4.9999 🥑	4.9999	4.9999	5.0000	Load Re
9	3.0000	3.0000 🥑	3.0000	2.9999	3.0000	
10	9.0000	9.0000 🥑	9.0000	8.9998	9.0000	Reset Laser
11	6.0000	6.0000 🥑	6.0000	5.9998	6.0000	Reset Laser
12	8.0000	8.0000 🥑	8.0000	7.9998	8.0000	
13	4.0000	4.0000 🥑	3.9999	3.9999	4.0000	
14	5.0000	4.9999 🥑	4.9999	4.9999	5.0000	Att Cotup
15	2.0000	2.0000 📀	1.9999	1.9999	2.0000	🍅 Setup
16						Acsults
Total	96.4098	95.9453			Thresholds	⅔ Functions

VLANs

NOT 1, NOT 2 but NOW 3 VLANs

ttb1-646206 - Ti	ghtVNC Viewer	
Test Applications	Test Configurator Timer System	FTB-880 NetBlazer
	Port 1 - 10/100/1000M Electrical 🤤	-
MAC MAC Address	00:03:01:FD:6A:69 Factory Default Frame Format 802.3 SNAP	
IP Version	Automatic IP (DHCP)	Start
	IP Address 10.10.106.105 Subnet Mask 255.255.0.0 Default Gateway	Save Report Discover Load Remote
VLAN XVLAN Tag 3	E-VLAN S-VLAN C-VLAN VLAN ID 2 2 2	Reset
	Priority 0 (000 - Low 🖌 0 (000 - Low 🖌 0 (000 - Low 🖌	Setup
	Type 0x9100 v 0x88A8 v 0x8100 v	Results
	Drop Eligible No Y No Y	K Functions
Interface Netwo		0000

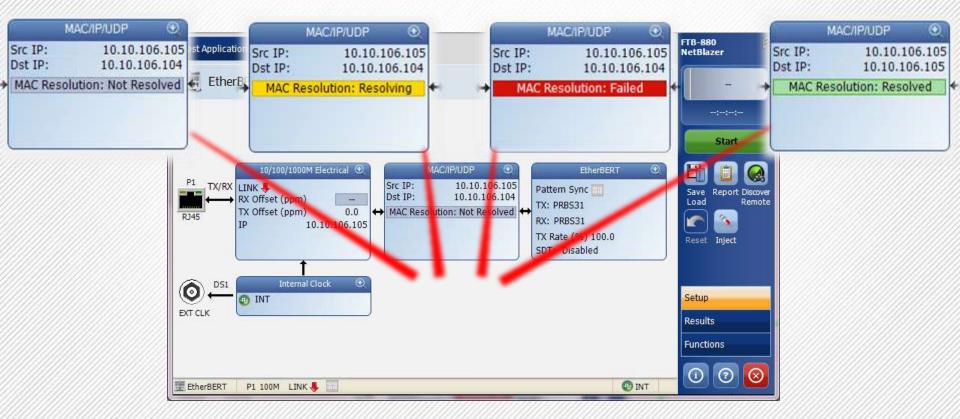
SMART LOOPBACK TWEAKS





Test Configurator

Test Configurator



Visual Frame Display

Choose your protocol, from basic to advanced

Test Applica	tions Test Co	nfigurator	Timer	System					FTB-880 NetBlazer
	Streams								
Modify Fra	Modify Frame Structure Couple with Interface 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16								
Preamble/	SFD MAC	VLAN	MPLS	IPv6	тср	Payload	FCS		Start
Ver. Tr	IPv6 affic Class F 0x00	low Label	E F	Link-Local I 000:0000:0			CCCC	Config	8
Payload Length	Next Header	Hop Limit 128	Source	Global IPv6	Address				Save Report Discover Load Remote
	urce IPv6 Addr ination IPv6 Ad	95	A DOUBLE DOUBLE	estination Ad		01FF:FEfd:(6a69	Quick Ping	Reset
	FE80::6A69			solve MAC				TOS/DS (Traffic Class)	
			Hop Lir	ource IP Mult nit	tiplicator	128		0x00	Setup
			Flow La			0		TOS/DS Config	Results Functions
Profile	MAC/IP/UDP	Global							
Mathic Gen	& Mon P1 1	00M LINK	t			_		🕕 INT	

EtherSAM Enhancments

	Quantity 8 EMIX Frame Sizes	512 1024 1256	1518 (1000)		Jumbo frame
		1	Restore Default Close	TAX	Jumbo france
II RFC frame siz	es ()		CONT CONT		
BFC frame su					
110	Test Applications	System		FTB-880 NetBlazer	
				NetBlazer	
		Services	Q	-	
	Service Service 1 Enab	le	1 2 3 4 5 6 7 8 9 10		
		SLA Parameters		Contract	
	TX Rate (%) 0.0	Information Rate 🛛 😽 🐱		Start	
	Test Parameters	CIR	50.0		
		CIR+EIR	75.0	Save Report Discover Load Remote	
	Traffic Policing 100.0	Burst Size Bytes	12		
	Burst Max Rate 100.0		64000	Reset	
	(10)		96000	Contract (
	Profile 🖬 Data 🍙	Performance Criteria			
		Max Jitter (ms)		Setup	
	Frame Size (Bytes) Emix Content	Frame Loss (%)		Results	
	(pyres)	Frame Loss (767		Parmanene //	
				Functions	

Visual Frame Display (VFD)

The VFD enables us to go deeper into the framing and to adjust to our heart's content

Test Applications Test Configurator Timer System	FTB-880 NetBlazer
Streams	-
Modify Frame Structure Couple with Interface 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 16	-:-:-:-
Preamble/SFD MAC Payload FCS	Start
MAC Source MAC Address 00:1C:AF:CC:CC:CC SRC ma	c modification
Source MAC Address 00:1C:AF:CC:CC EtherType	Load Remote
EtherType 0x010B	Reset
EtherType modification	
modifice	Setup
	Results
Profile MAC/IP/UDP Global	Functions
Traffic Gen & Mon P1 100M LINK	0 0 0

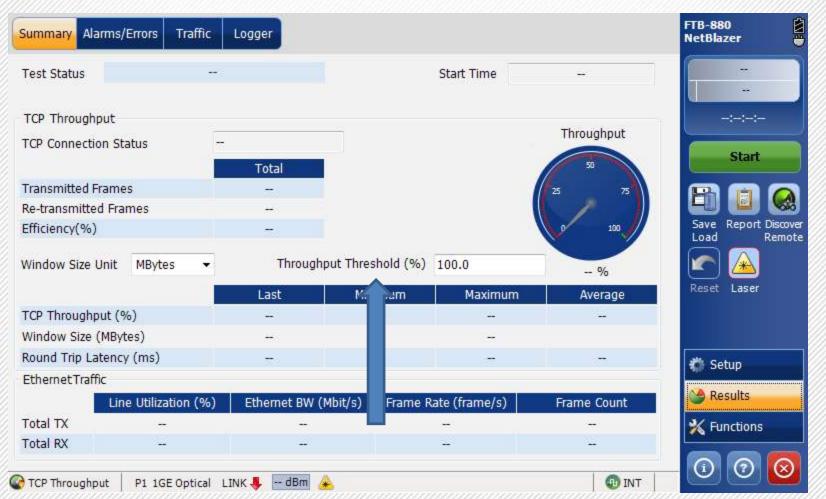


TCP Throughput

ExacTCP

NetBlazer Series Now Equipped with TCP Throughput Test App Application!

SinspirepleOneORageaTes5Btepults!

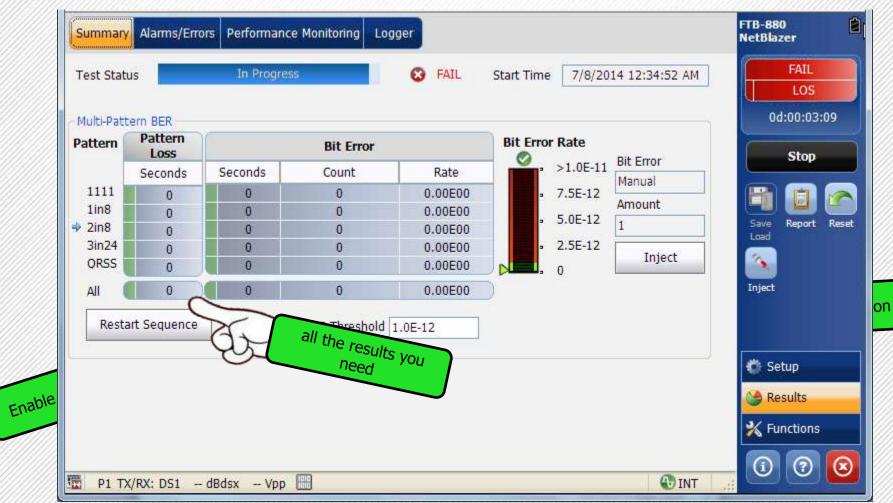


The NetBlazer Series Now Supports TCP Throughput Testing

Automated BERT

DS1 Feature

Legacy Anyone?



L2 Transparency Testing

What Is a Layer-2 Transparency Test?

- Simulates the processing of layer-2 control protocol (L2CP) frames through a network
- Control frames interact with network devices while data frames pass through a network without interacting with the devices that comprise the network
- Example of control protocols: spanning tree (STP, RSTP, MSTP), link aggregation (LACP), Cisco's proprietary protocols (CDP, VTP, PagP, etc.)
- Verifies transparent forwarding of L2CP frames through switched and/or routed networks

L2CP Frames

> Parameters used to generate L2CP frames:

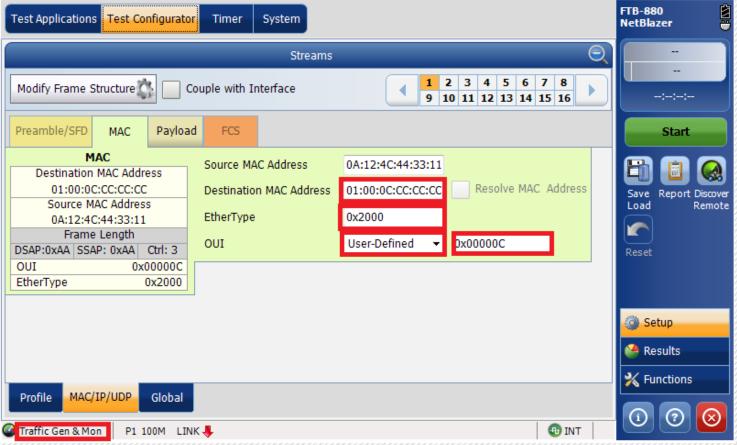
- Destination MAC address: Always set to a multicast value.
 This value depends on L2CP and how it is used.
- Protocol identifier: Depending on the protocol, it is typically a combination of the following: frame format, EtherType or LLC (depending on format) and subtype.
- > In certain cases: frame size and frame rates.

Destination MAC Address		Frame Format	EtherType or	Subtype	
Example:	Protocols	Prot	ocol Identifier		Destination MAC Address
	CDP	0000900	ne format: 802.3 rtype = 0x2000; (01-00-0C-CC-CC

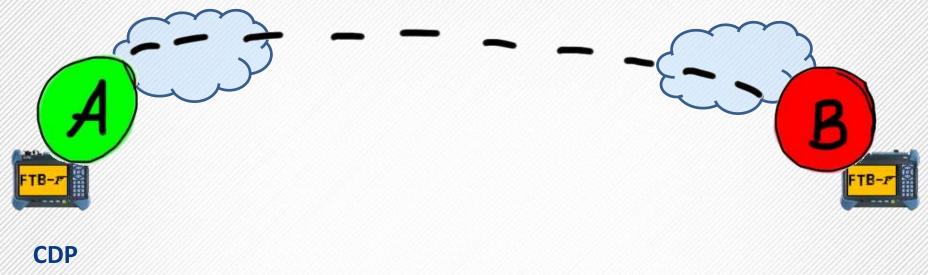
L2 Transparency on the NetBlazer

Example

Protocols	Protocol Identifier	Destination MAC Address
CDP	Frame format: 802.3 SNAP Ethertype = 0x2000; OUI=0x00000C	01-00-0C-CC-CC-CC



Layer-2 Transparency



PVST+

RDP 5 FRAMES SENT

5 FRAMES RCVD

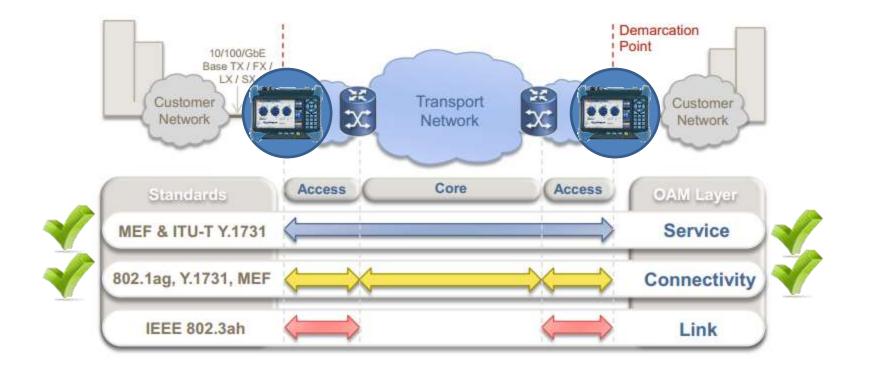
The NetBlazer Series Now Supports Layer-2 Transparency Tests

Carrier Ethernet OAM



Why S-OAM?

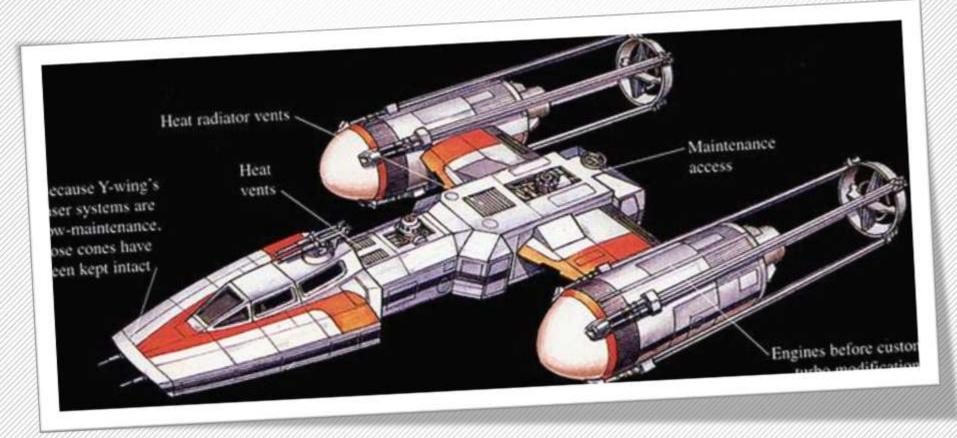
Service Operations and Maintenance



OAM Layer	Function/Focus
Service	End-to-end service (customer) view, reflected in SLAs
Connectivity	Network and service connectivity and performance monitoring, topology-aware, multidomain
Link	Focused on single-hop links, 1 st mile transport

Y.1731

It's NOT the new Y wing!



ITU-T Y.1731 & MEF

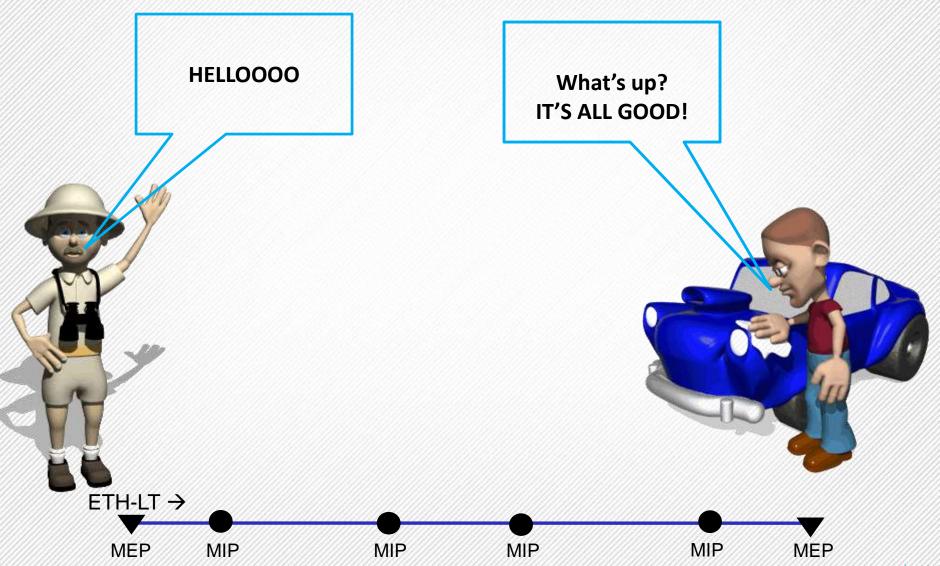
		Y.1731	MEF
Y.1731 whic	Continuity Check	\checkmark	✓
unparallele	Loopback	✓	~
service-leve	Link Trace	✓	~
standard for Fault Management	RDI	~	✓
Fault Management	AIS	\checkmark	✓
	CSF	✓	~
	LCK	✓	✓
	Test	✓	✓
	Frame Delay	√	✓
	Frame Delay Variation	√	✓
TH Management	Frame Loss	\checkmark	✓
	Synthetic Loss	\checkmark	√

802.1ag

2.1a		Y.1731	MEF	802.1ag	sists of
ultipl e cor	Continuity Check	\checkmark	✓	\checkmark	der to check
	Loopback	✓	✓	✓	hily
	Link Trace	√	\checkmark	√	
	RDI	✓	✓	✓	
Fault Management	AIS	✓	✓		
	CSF	✓	\checkmark		
	LCK	\checkmark	\checkmark		
	Test	\checkmark	✓		
	Frame Delay	1	✓		
Performance	Frame Delay Variation	✓	√		
Management	Frame Loss	√	✓		
	Synthetic Loss	✓	✓		

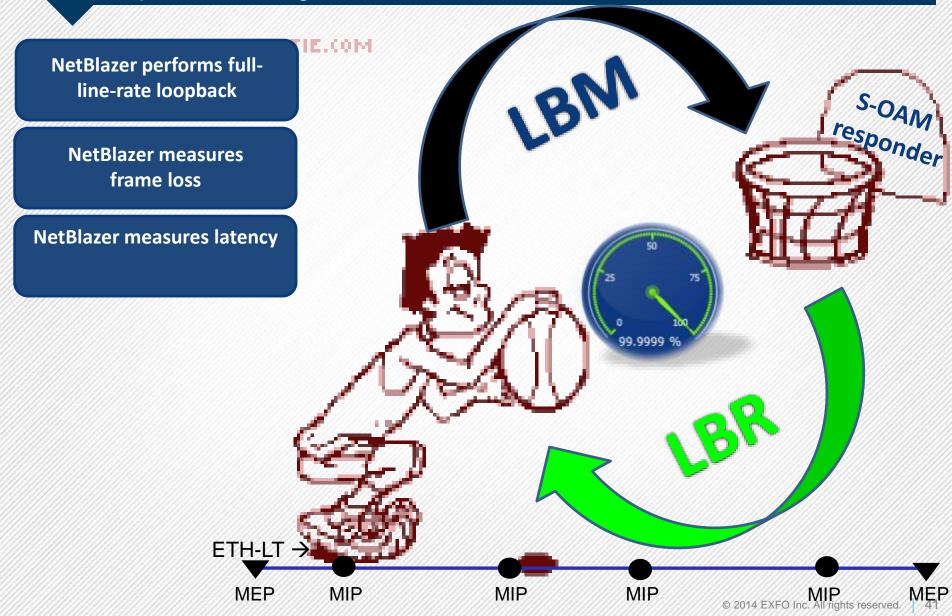
Whats a CCM

Continuity Check Message



What Is an LBM?

Loopback Message



S-OAM Link Trace

Trace Route Anyone?

а

milar to Trace Route	Ftb1-646206 - TightVNC Viewer S-OAM Link Trace Ping & Trace Route
at, we now find the EP/MIP and its MAC dress, as well as the terminating MEP.	Link Trace TTL 128 Link Trace Result TTL MEP/MIP MAC Address Forward Term MEP TTL Count TX LTM 0 RX LTR 0 LTR Timeout 0 Invalid LTR 0
	Last Link Trace Status

The NetBlazer Series Now Supports Carrier Ethernet OAM

Packet Capture

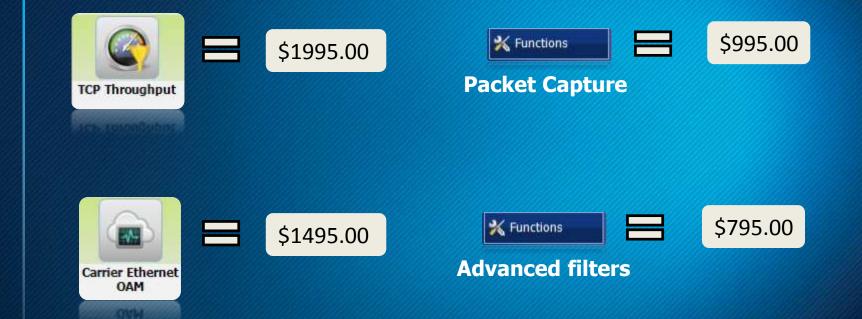
Advanced Filters and Packet Capture

- Looking to capture data from electrical or optical ports? With NetBlazer, it is now possible.
- > 10 Base-T to 10 GigE
-) BERT
- > TGEN
- Through mode (one direction at a time)
- > SyncE
- > 1588 PTP
- > OAM
- › Advanced filtering
- > Four filters
- > Each filter has four choices with operands
- Perfect for pinpointing issues or seeing distinct traffic
- > Supports up to 16 distinct choices and values

_							
	iable					ign to	
En	abled Time	00d:00:00:42			Cat	oture	
	onfiguration ——						
(No	ot Filter		Value	Mask)	Ope	
IPv4 Source Address		10.8.232.105	255.255.255.255		AND		
	UDP Source Port IPv4 Protocol		0	0×FFFF		AND	
			17	0×FF		AND	
	IPv4 Preced	ence	000	111			
Filter St	atistics]				1	
		Line Utilization (%	6) Ethernet BW (Mbit/	s) Frame Rate (frame/s)	Frame Cou	nt	
RX		0.000000	0.0	0	0		
		Error Count		Error Count			
IP Chec	ksum	0	Jabber/Giant	0			
UDP Ch	ecksum	0	Oversize	0			
FCS		0	Runt	0			
			Undersize	0			



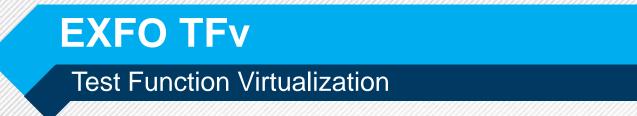
Latest NetBlazer Pricing





Agenda

- 1 Introduction
- 2 Release 2.2 new features
- **3 EXFO TFV**
- 4 Conclusion





FTB Anywhere FTB OnDemand

- EXFO TFv is a cloud-based suite of applications focused on virtualized test functions
- Currently, FTB Anywhere and FTB OnDemand are included under this umbrella.

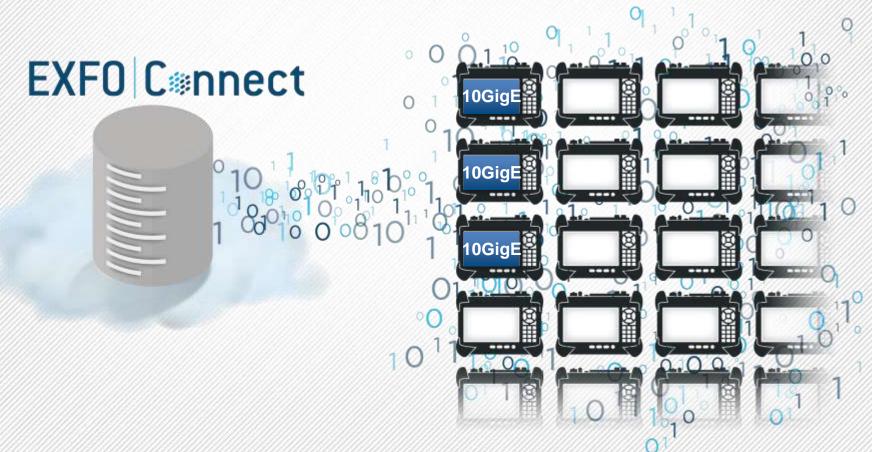
Saving More through Shared Software Options

FTB Anywhere



Saving More through Shared Software Options

FTB Anywhere



FTB OnDemand

Overview

FTB OnDemand

Time-based SW licenses (i.e., SW options that expire on a set date)

WHY?

WHAT?

Offers more flexibility in terms of managing SW options and their costs

WHERE?

Available for some (not all) SW options on the NetBlazer and Power Blazer Series of products

HOW?

The offering is activated through a special EC server owned and managed by EXFO (no EXFO Connect subscription required)

Whatever Your Choice Is...

FTB Anywhere FTB OnDemand





- > You can say NO to techs not having the right tool for the job
- > You can say NO to filling out shipping waybills
- You can say NO to packing up test tools for shipment across country
- > You can say NO to units damaged during shipping
- You can say NO to having to ship equipment across the country using FedEx, UPS and DHL
- Finally, you can say NO to having no other option but to go with the static-restrictive non-floating options offered by the competition



Agenda

- 1 Introduction
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- 3 EXFO TFV
- **4** Conclusion

You have what you need!

- User-friendly and consistent GUIs across the following modules:
 - > 860/860G/870 /880 & 700G
 - > 85100G/88100NG or 88100NGE
- Now identical feature set for modules 10G and below; providing greater flexibility and a seamless transition from the following 1G to 100G products :
 - > 860/860G/870 /880 & 700G
 - > 88100NG or 88100NGE
- Completely revamped and fortified FTB-860/860G/870/880 modules making it easier for field technicians to carry out their daily test operations efficiently





The NetBlazer Portfolio

The Field Techs "ALL-in-ONE"



EXFO Connect

 Automation and business intelligence
 Cloud-based equipment and test data management

FTB Anywhere™ Floating Test Licenses

- Budget flexibility
- > Available anywhere, anytime and to anyone
- Eliminating barrier to field-testing efficiency
 Feature-rich solution

Thank You