



Y.1564 Standard V-SAM Overview

Rev A04 – September 2011

- Introduction to Y.1564 Standard
 - Y.1564 versus RFC2544
 - Important Definitions
 - Test Methodology
- VSAM
 - VeEX Service Activation Methodology
 - Test features and User Interface

- ITU-T Y.1564 defines an out-of-service test methodology



- Service Activation Test Methodology (SAM)

- Users can assess the proper configuration and performance of an Ethernet service prior to customer delivery.

- In particular, Y.1564 is aimed at addressing and solving the deficiencies of RFC 2544

- Benefits to the User

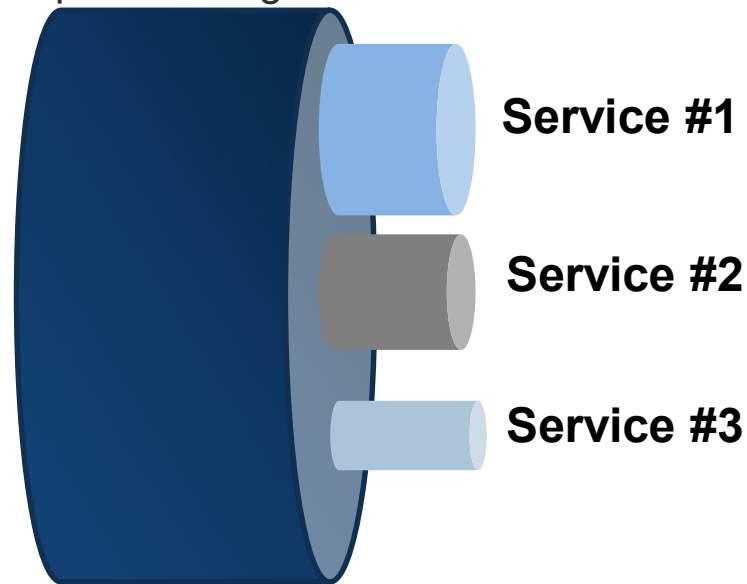
- Total test time is drastically reduced - Services are being tested over a longer duration simultaneously, and all the SLA parameters are also measured simultaneously.

- Results reporting - clear and simple “Pass/Fail” indication in Green/Red. This is for each test, each service, with a global indication.

	RFC2544	Y.1564
Key Test Objective	Device performance	Network Service verification/activation
Service validation	One service at a time	Multiple services simultaneously
Throughput	Yes	Yes
Latency	Yes	Yes
Frame Loss	Yes	Yes
Burstability	Yes	Yes
Packet Jitter	No	Yes
Multiple Streams	No	Yes
Test Duration	Long (serialized test procedure)	Short (simultaneous test/service)
Test Result	Link performance limit	Related to SLA, fast, simple, Pass/Fail

■ Service:

- EVC (Ethernet Virtual Connection) in the MEF standards
- Connects customer sites with a 10/100/1000 or 10G Ethernet interface
- Service rate below the Ethernet line rate i.e. Full rate granularity
- Multiple services can share the same line
- Easy remote provisioning or re-provisioning



**Ethernet Line:
10/100/1000 or 10G**

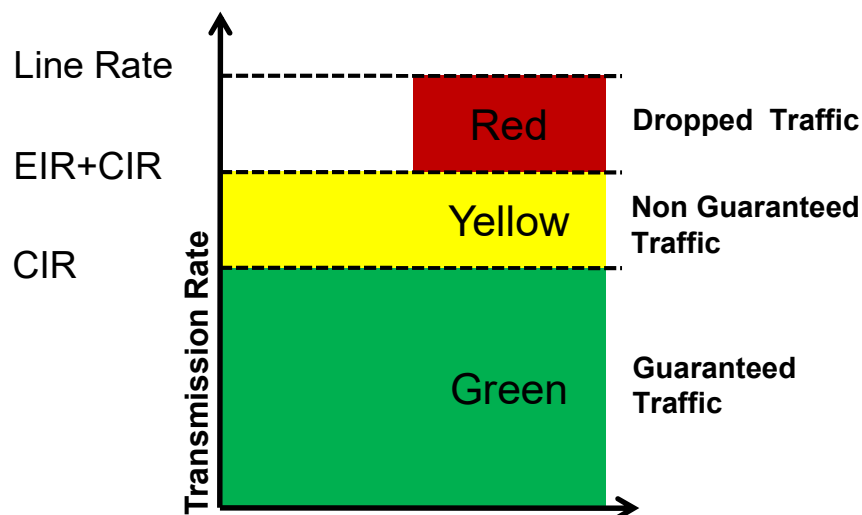
- **Service is defined by the following key parameters:**
 - **Bandwidth Profile:** Specifies how much traffic the customer is authorized to transmit and how the frames are prioritized within the network.
 - **Committed Information Rate (CIR)**
 - **Excess Information Rate (EIR)**
 - **Committed Burst Size (CBS)**
 - **Excess Burst Size (EBS)**
 - **Color Mode (CM)**
 - **Service Acceptance Criteria:** Parameters defining the performance objectives. Values define the minimum requirements to ensure that the service meets the Service Level Agreement (SLA).
 - **Frame Transfer Delay (FTD)**
 - **Frame Delay Variation (FDV)**
 - **Frame Loss Ratio (FLR)**
 - **Availability (AVAIL)**

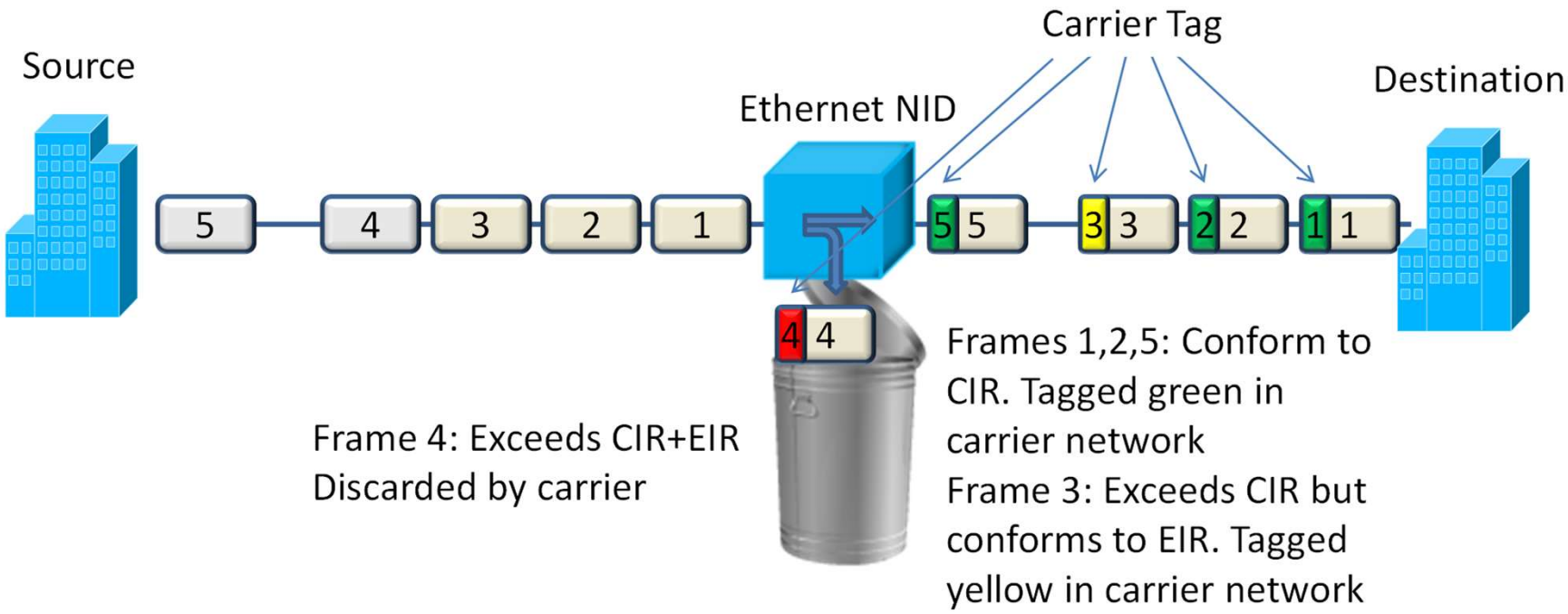
- **Committed Information Rate (CIR):**

- Guaranteed maximum rate at which the customer can send frames that are assured to be forwarded through the network without being dropped.

- **Excess Information Rate (EIR):**

- Maximum rate above the CIR at which the customer can send frames that will be forwarded on a best effort basis, but may be dropped in the event of congestion within the network. Traffic beyond CIR + EIR will be dropped when it enters the carrier's network.



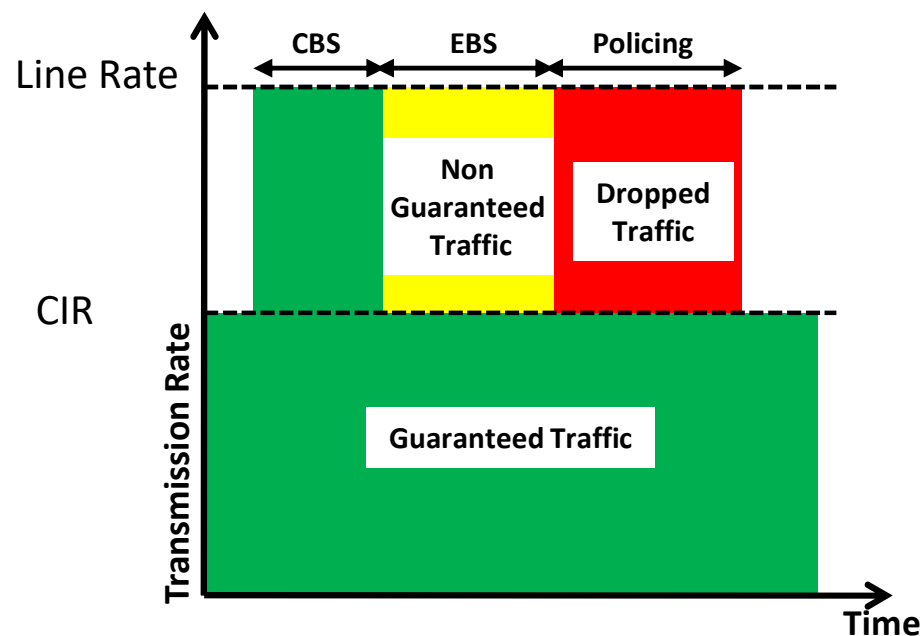


■ Committed Burst Size (CBS):

- Describes the maximum number of consecutive frames sent at full line rate that the service is allowed to transmit and that are assured to be forwarded.

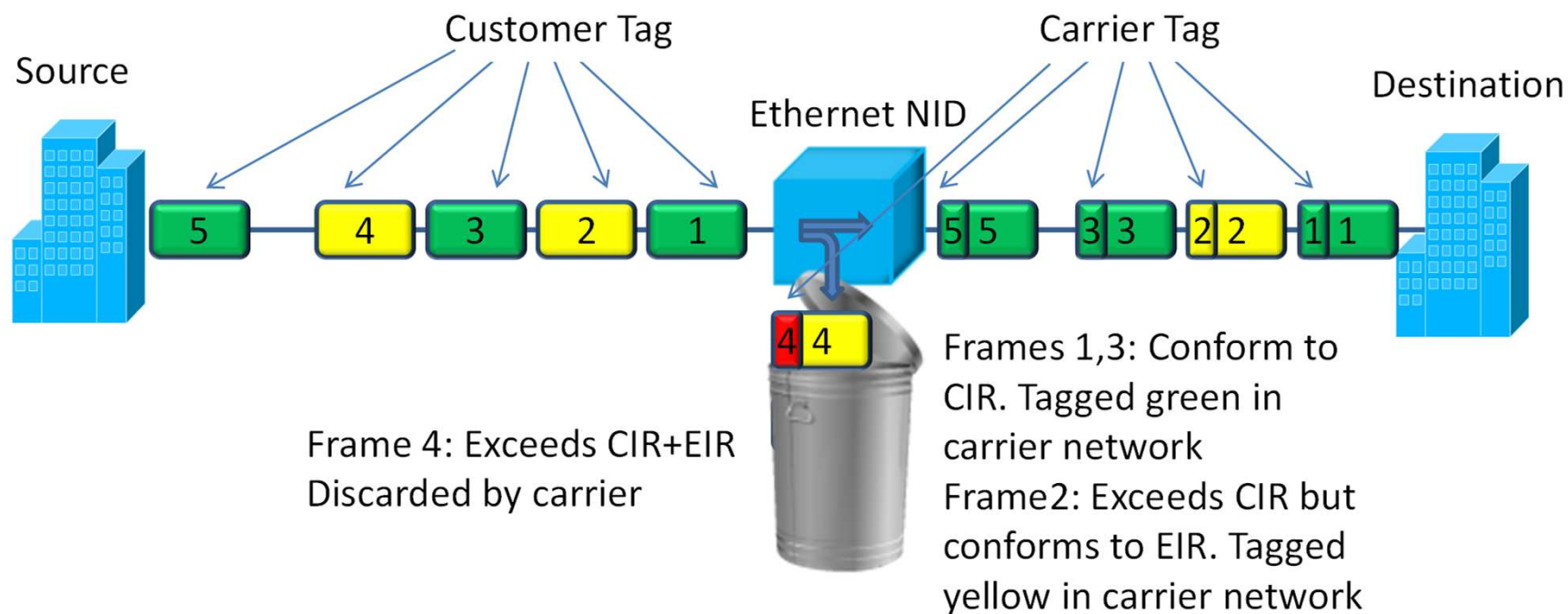
■ Excess Burst Size (EBS):

- Describes the maximum number of frames sent at full line rate on top of the CBS that will be forwarded on a best effort basis, but may be dropped in the event of congestion within the network.



■ Color Mode (CM):

- Allows the customer to pre-mark their traffic with a priority tag rather than letting the carrier blindly enforce the CIR/EIR/CBS/EBS algorithm on the traffic.



■ **Frame Transfer Delay (FTD):**

- Maximum transfer time that the frames can take to travel from source to destination, and still be compliant with the SLA. FTD is only guaranteed for traffic conforming to the CIR.

■ **Frame Delay Variation (FDV):**

- Maximum frame jitter allowed to still be compliant with the SLA. FDV is only guaranteed for traffic conforming to the CIR.

■ **Frame Loss Ratio (FLR):**

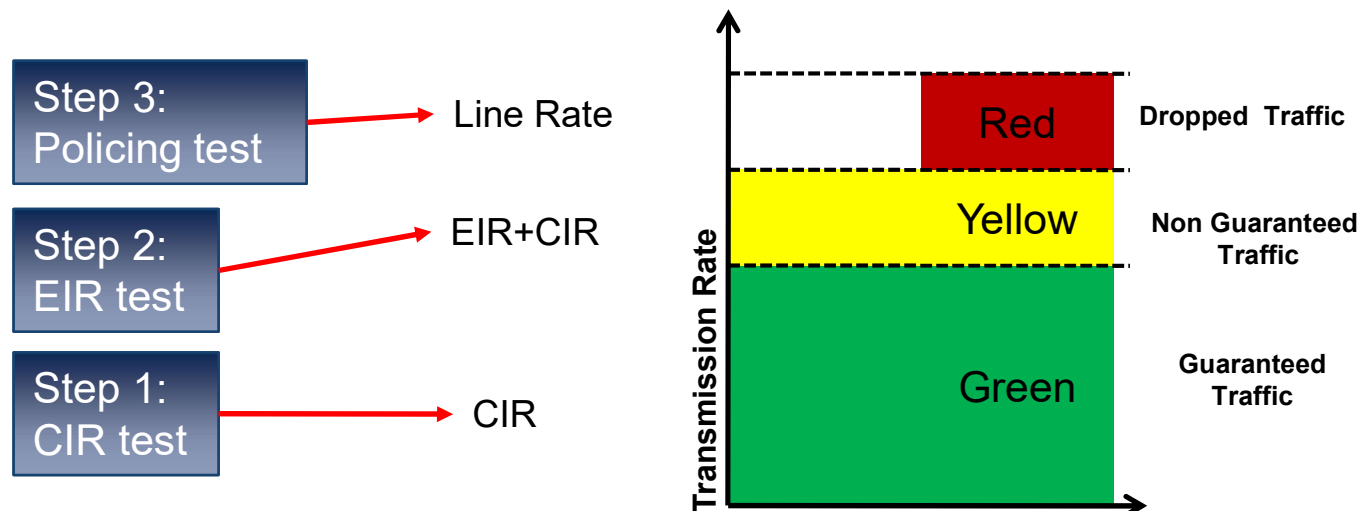
- Maximum ratio of lost frames to the total transmitted frames allowed to still be compliant with the SLA. FLR is only guaranteed for traffic conforming to the CIR.

■ **Availability (AVAIL):**

- Minimum percentage of service availability allowed to still be compliant with the SLA. The service becomes unavailable if more than 50% of the frames are errored or missing in a one second interval. Availability is only guaranteed for traffic conforming to the CIR.

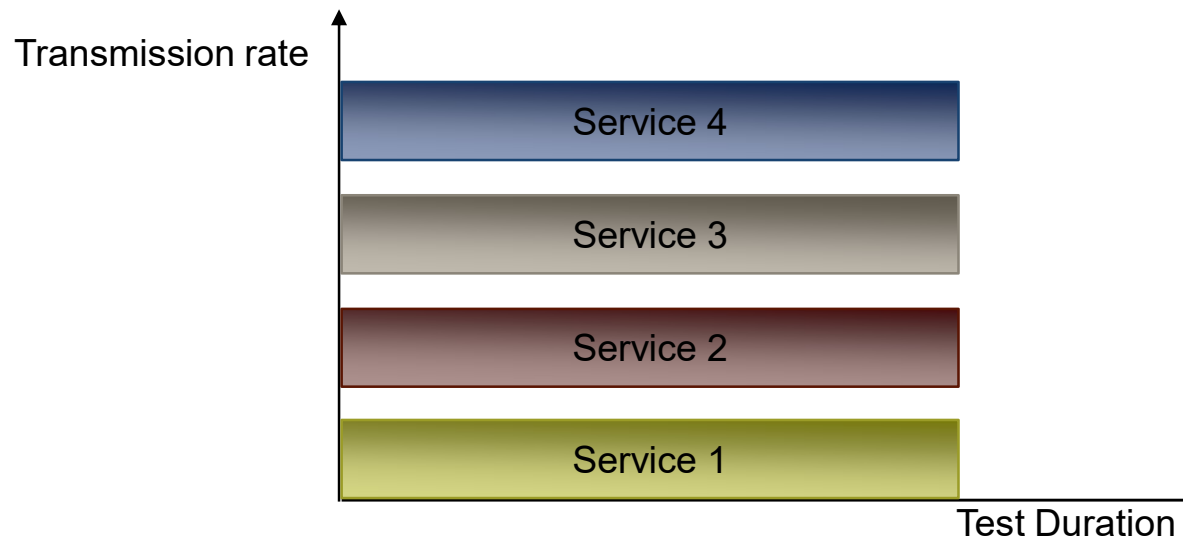
■ Phase 1: Bandwidth Profile test:

- Service running on the same line are tested one by one to verify the correct service profile provisioning.
 - **Step 1 CIR Test:**
 - TX at CIR rate and measure SAC on RX traffic
 - **Step 2 EIR Test (optional):**
 - TX at CIR+EIR rate and measure that RX traffic \geq CIR
 - **Step 3 Traffic Policing or overshoot Test (optional):**
 - TX at 25% greater than CIR+EIR and verify that traffic greater than CIR+EIR is blocked
 - **CBS and EBS Tests:** experimental and not an integral part of the standard

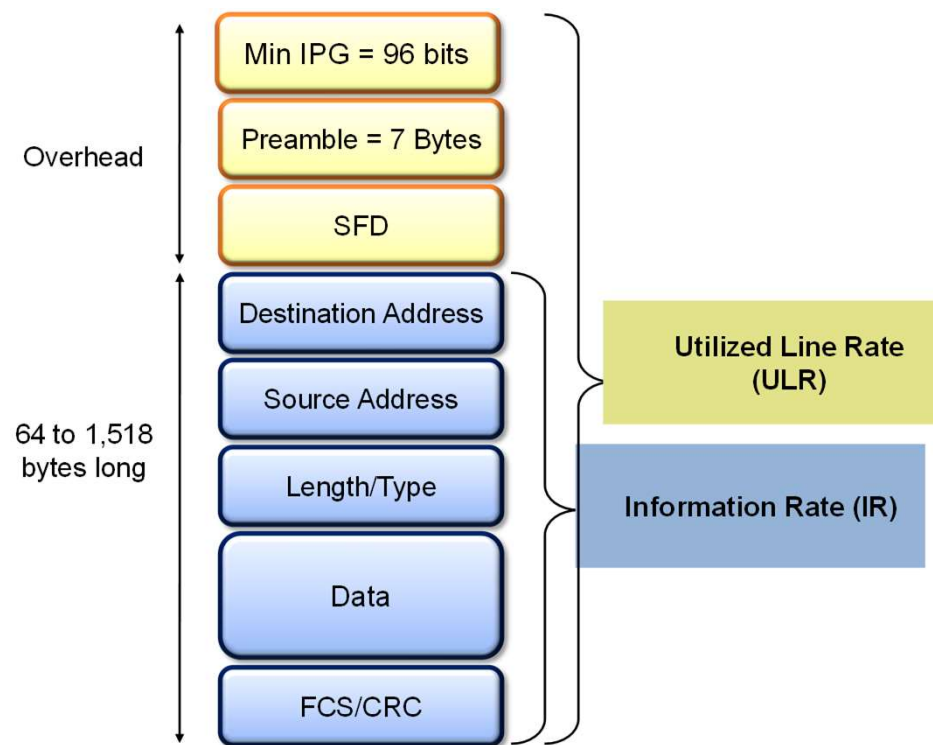


■ Phase 2: Service Performance test:

- Services running on the same line are tested simultaneously over an extended period of time, to verify network robustness.
- SACs (Service Acceptance Criteria)
 - Frame Transfer Delay (FTD), Frame Delay Variation (FDV), Frame Loss Ratio (FLR) and Availability (AVAIL) are verified for each service



- CIR and EIR can be expressed in terms:
 - **Information Rate (IR)** - measures the average Ethernet frame rate starting at the MAC address field and ending at the CRC.
 - **Utilized Line Rate (ULR)** - measures the average Ethernet frame rate starting with the overhead and ending at the CRC.
 - Example: 100 Mbps line
 - @1518byte Max IR is 98.7Mbps
 - @ 64byte Max IR is 76.19Mbps
 - ULR stays constant at 100Mbps



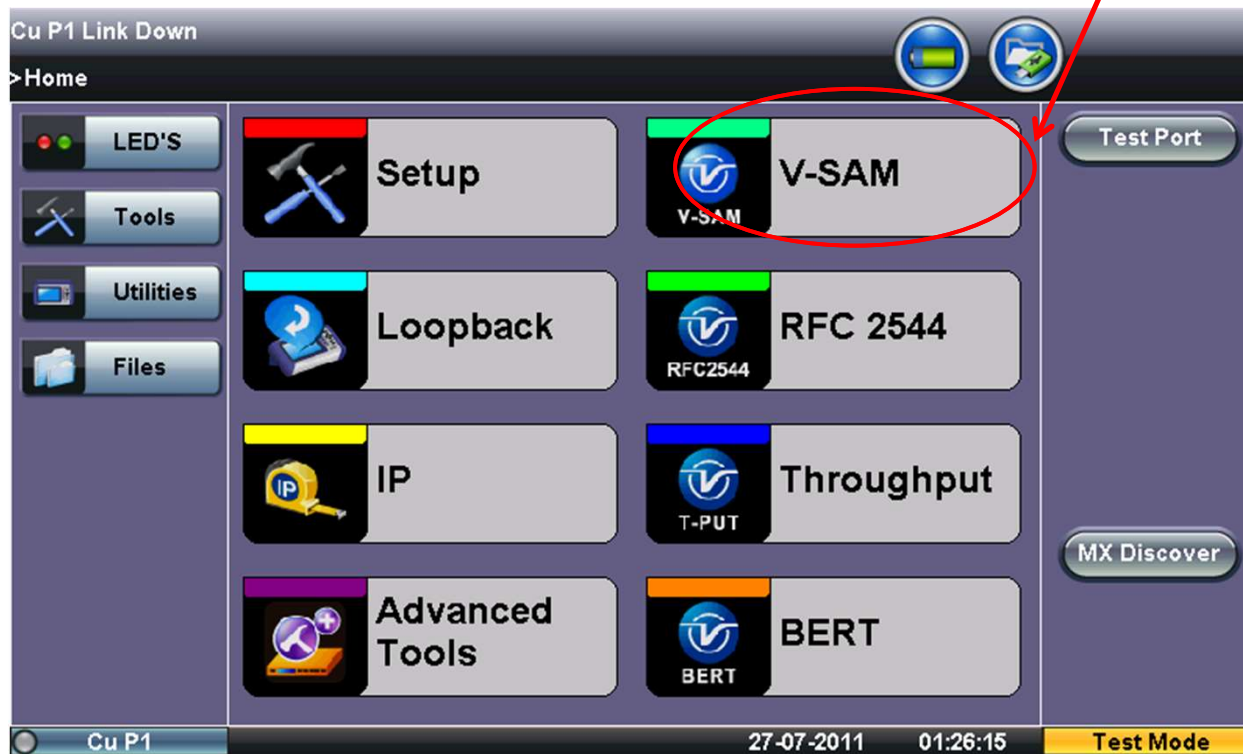


V-SAM Overview

Test Features and User Interface

- V-SAM is an automated Ethernet service activation test feature conforming to the new Y.1564 standard approved and published by ITU-T in March 2011.
- V-SAM (**VeEX Service Activation Methodology**) ensures repeatable, simple and rapid pass/fail results for activating multiple Ethernet-based services.
- V-SAM enhances VeEX testers used to verify mobile backhaul networks and Ethernet business services.
- V-SAM is available for all VeEX V100+ and V300 testers supporting Ethernet test capability.
 - TX300 and MX300 units (Q3'2011)
 - MX100+, MX120+, TX130E+ and TX130M+ platforms (early Q4'2011).
- V-SAM is a no-charge option which complements the RFC-2544 and Advanced SLA verification test applications

V-SAM Test is accessed
from the Home menu



Select # of Services
Up to 8 on 1GE interface
Up to 10 on 10GE interface

Committed Information Rate Test setup

Service Configuration and Performance Tests can be enabled independently

The screenshot shows the 'Setup' tab of the V-SAM configuration tool. It includes a sidebar with 'LED'S', 'Tools', 'Utilities', and 'Files'. The main area is divided into 'General' and 'Services' sections. The 'General' section has a 'V-SAM Profile' dropdown set to 'Default', a '# of Services' dropdown set to '8', and checkboxes for 'Service Configuration Test' and 'Service Performance Test'. The 'Services' section features a 'Simple CIR' dropdown and a 'Duration' dropdown set to '15min'. Below these is a table with 8 services, each with a checked checkbox and columns for Service #, Name, CIR (Mbps), EIR (Mbps), Traffic Policing, CBS (KB), and EBS (KB). At the bottom, it shows 'Total IR(CIR+EIR):800.000Mbps(810.540Mbps ULR)' and 'Page 1 of 2'. The status bar at the bottom indicates 'Cu P1', '27-07-2011', '01:27:07', and 'Test Mode'. On the right side, there are 'Start', 'MX Discover', and 'Control' buttons.

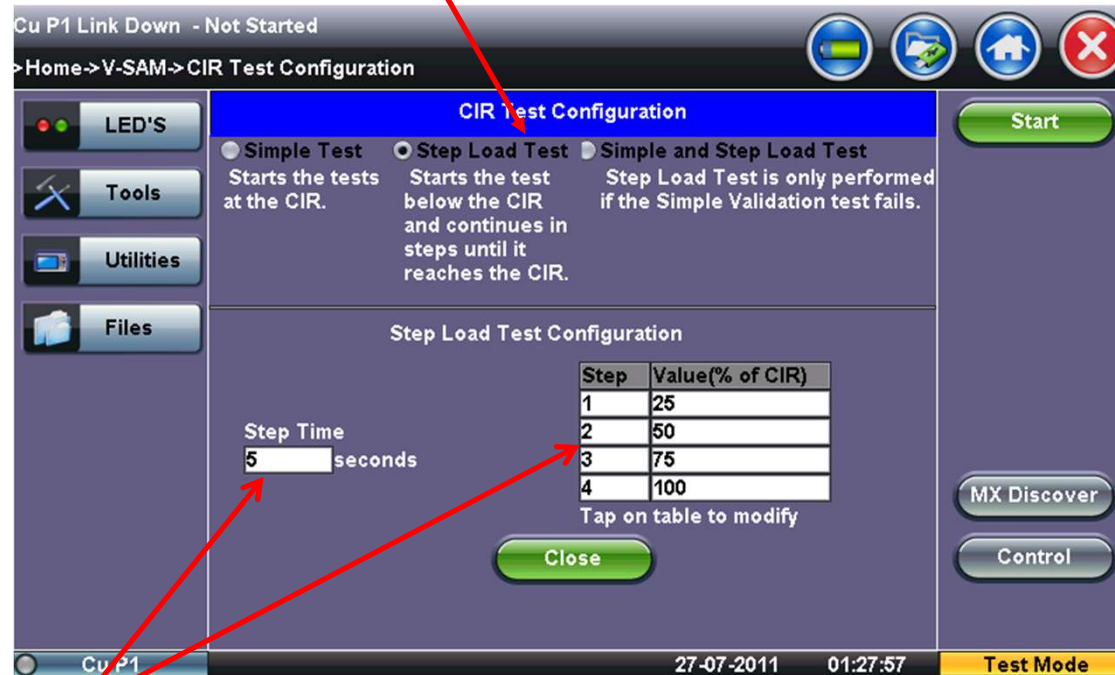
Service #	Service Name	CIR (Mbps)	EIR (Mbps)	Traffic Policing	CBS (KB)	EBS (KB)
<input checked="" type="checkbox"/>	1 Service 1	100.000	0.000	Yes	-	-
<input checked="" type="checkbox"/>	2 Service 2	100.000	0.000	Yes	-	-
<input checked="" type="checkbox"/>	3 Service 3	100.000	0.000	Yes	-	-
<input checked="" type="checkbox"/>	4 Service 4	100.000	0.000	Yes	-	-
<input checked="" type="checkbox"/>	5 Service 5	100.000	0.000	Yes	-	-
<input checked="" type="checkbox"/>	6 Service 6	100.000	0.000	Yes	-	-
<input checked="" type="checkbox"/>	7 Service 7	100.000	0.000	Yes	-	-
<input checked="" type="checkbox"/>	8 Service 8	100.000	0.000	Yes	-	-

Summary table of Service configuration

Loopback control
And OAM
loopback control

Service Configuration Test Duration: If Simple is selected, user can configure the value in seconds.
Service Performance Test Duration: Selections are 15min, 30 min, 1hr, 2hr, 24hr, or user defined

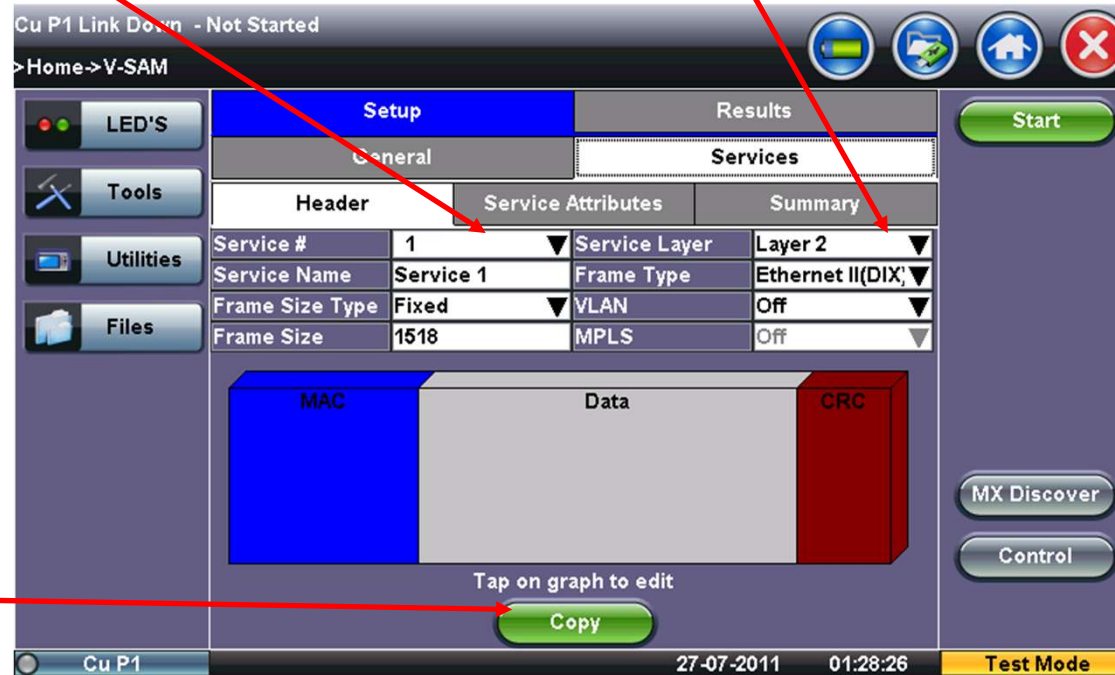
Select CIR Test type and duration



of Steps: Default number of steps is 4
Step Time: Default is 5 seconds.

Select Service to configure

Layer 2 through Layer 4 test traffic



Cu P1 Link Down - Not Started
> Home->V-SAM

LED'S Tools Utilities Files

Setup Results

General Services

Header		Service Attributes		Summary	
Service #	1	Service Layer	Layer 2	Frame Type	Ethernet II(DIX)
Service Name	Service 1	VLAN	Off	MPLS	Off
Frame Size Type	Fixed				
Frame Size	1518				

MAC Data CRC

Tap on graph to edit

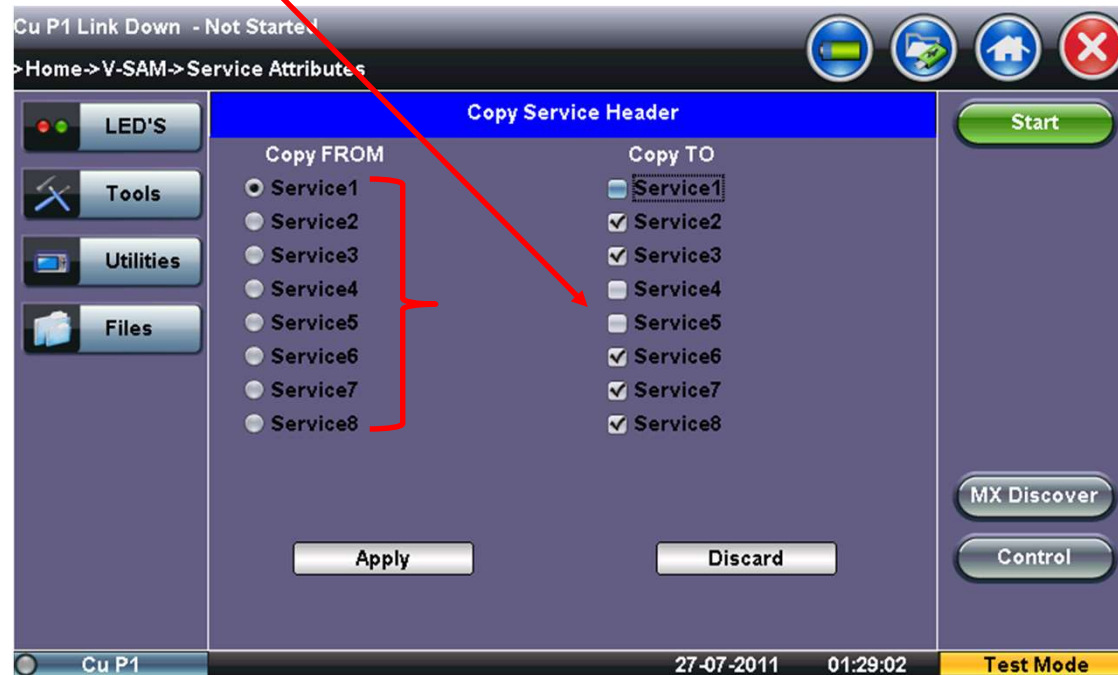
Copy

Start MX Discover Control

Cu P1 27-07-2011 01:28:26 Test Mode

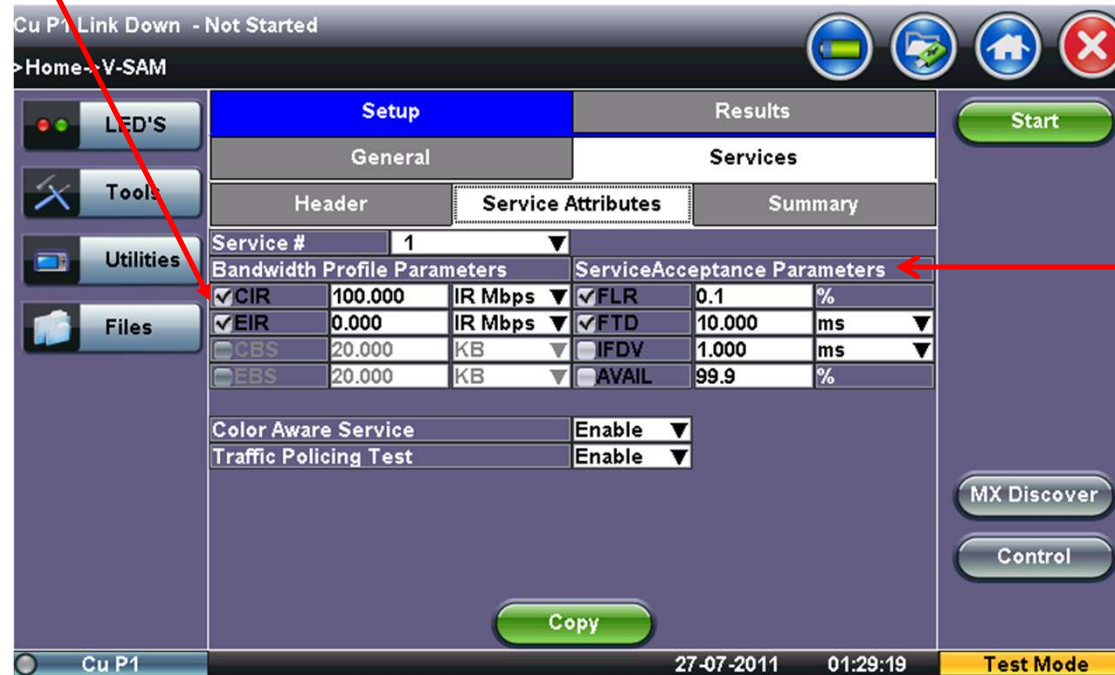
Copy Test frame setup

Frame configuration can be copied between services



CIR, EIR, and Traffic Policing testing can be enabled independently. (EBS/CBS future)

Service Acceptance Thresholds can be configured and enabled independently



Note:

CBS: Max # of frames able to be sent (bytes) with a min IFG (Inter Frame Gap) at the interface line rate above the CIR.

EBS: Max # of frames able to be sent (bytes) with a min IFG at the interface line rate above the EIR.

Table summarizing frame configuration for all services

Cu P1 Link Down - Not Started

> Home -> V-SAM

LED'S Tools Utilities Files

Setup		Results
General		Services
Header	Service Attributes	Summary
Service#	MAC Source	MAC Dest.
1	00-18-63-00-0C-40	00-1E-90-A0-57-3C
2	00-18-63-00-0C-40	00-1E-90-A0-57-3C
3	00-18-63-00-0C-40	00-1E-90-A0-57-3C
4	00-18-63-00-0C-40	00-1E-90-A0-57-3C
5	00-18-63-00-0C-40	00-1E-90-A0-57-3C
6	00-18-63-00-0C-40	00-1E-90-A0-57-3C
7	00-18-63-00-0C-40	00-1E-90-A0-57-3C
8	00-18-63-00-0C-40	00-1E-90-A0-57-3C

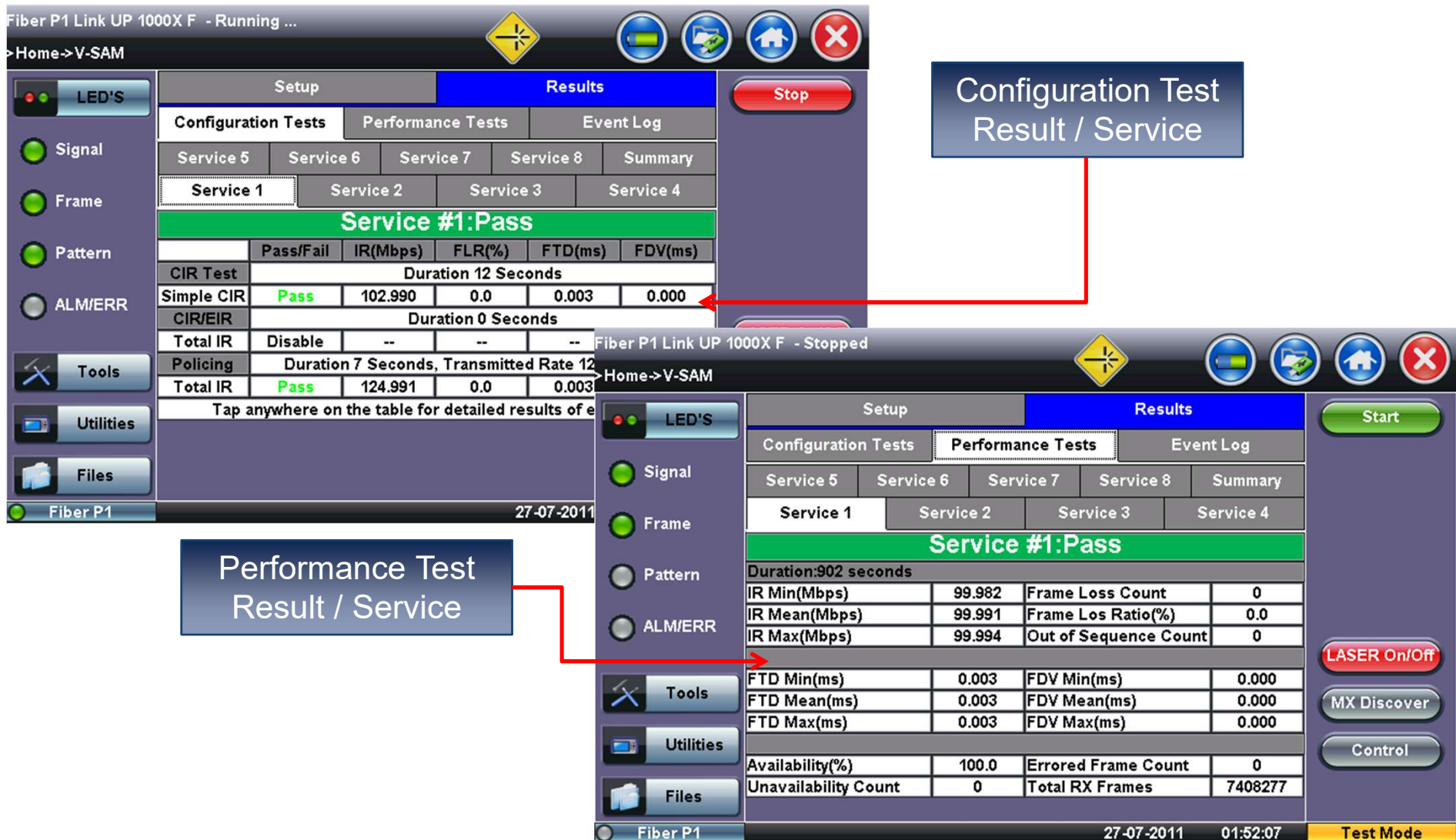
Start

MX Discover

Control

Page 1 of 1

Cu P1 27-07-2011 01:29:39 Test Mode



Configuration Test Result / Service

Performance Test Result / Service

Configuration Test Result / Service (Detailed View):

Service	Pass/Fail	IR(Mbps)	FLR(%)	FTD(ms)	FDV(ms)
Service 1	Pass	102.990	0.0	0.003	0.000

Performance Test Result / Service (Detailed View):

Service	IR(Mbps)	FLR(%)	FTD(ms)	FDV(ms)
Service 1	99.982	0.0	0.003	0.000
Service 1	99.991	0.0	0.003	0.000
Service 1	99.994	0.0	0.003	0.000

The screenshot displays two windows from the VeEX V-SAM interface. The top window, titled 'Fiber P1 Link UP 1000X F - Running ...', shows the 'Configuration Tests' tab. The bottom window, titled 'Fiber P1 Link UP 1000X F - Stopped', shows the 'Performance Tests' tab. Red arrows point from text boxes to specific elements in the interface.

Configuration Test Result Summary

Service	CIR	CIR/EIR	Traffic Policing
1	Pass	Disable	Pass
2	Pass	Disable	Pass
3	Pass	Disable	Pass
4	Pass	Disable	Pass
5	Pass	Disable	Pass
6	Pass	Disable	Pass
7	Pass	Disable	Pass
8	Pass	Disable	Pass

Performance Test Result Summary

	Pass/Fail	IR(Mbps)	FLR(%)	FTD(ms)	FDV(ms)	AVAIL(%)
1	Pass	99.991	0.0	0.003	0.000	100.0
2	Pass	99.991	0.0	0.003	0.000	100.0
3	Pass	99.991	0.0	0.003	0.000	100.0
4	Pass	99.991	0.0	0.003	0.000	100.0
5	Pass	99.991	0.0	0.003	0.000	100.0
6	Pass	99.991	0.0	0.003	0.000	100.0
7	Pass	99.991	0.0	0.003	0.000	100.0
8	Pass	99.991	0.0	0.003	0.000	100.0

Total IR is displayed for CIR/EIR and Traffic Policing Tests.
User can view Green (CIR) and Yellow (EIR) rates by tapping on the service tabs



Thank you.

Any questions?