

***The ultimate way to reduce your
turn-up and troubleshooting time***

UniPRO MGig1
Carrier-grade Ethernet tester

UniPRO SEL1
Intelligent loopback device



Mobile Backhaul

- **Base station to control node**
- **Small cell and microcell**
- **Traffic offload WiFi access point**
- **Radio link installation test**

Carrier Service Turn-up

- **E-private line (EPL)**
- **E-virtual private line (EVPL)**
- **Provision check for service turn-up**
- **SLA dispute resolution**
- **Network stress testing**

Key Applications

- **Y.1564 (NetSAM) and RFC2544**
- **BERT and SLA-Tick**
- **Multi services and Bi-Directional tests**
- **IPv4 and IPv6 - simultaneous**
- **QinQ, multiple VLAN and MPLS**
- **Cost effective for all telcos, service providers, sub-contractors, utilities and enterprise users**
- **One touch to run multiple tests sequentially - unattended**

The time saving tester

Many hours are wasted on-site while network configuration and patching issues are ironed out before testing can even begin.

UniPRO MGig1 has a suite of tools that can frequently cut this time by half a day.

And with its remote control function for loopback and Bi-Directional testing, only one engineer is needed. A vast resource saving.

Autotest allows multiple tests to be run unattended.

Mobile Backhaul

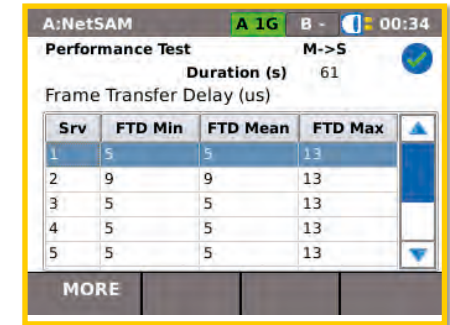
Base Station to Control Node - Ethernet Backhaul Performance Test

2G - BTS to BSC | 3G - Node B to RNC | 4G/LTE eNode B to eRNC

Whether the backhaul is fibre, copper or microwave radio, UniPRO MGig1 Bi-Directional concurrent multiple service (stream) performance assurance tests

- SLA-Tick and
- Y.1564 (NetSAM)

prove whether full committed information rates are achieved with separate VLANs having different priority levels (e.g. signaling, management, voice, data) and that priorities are correctly enforced.



A:NetSAM A 1G B - 00:34

Performance Test M->S

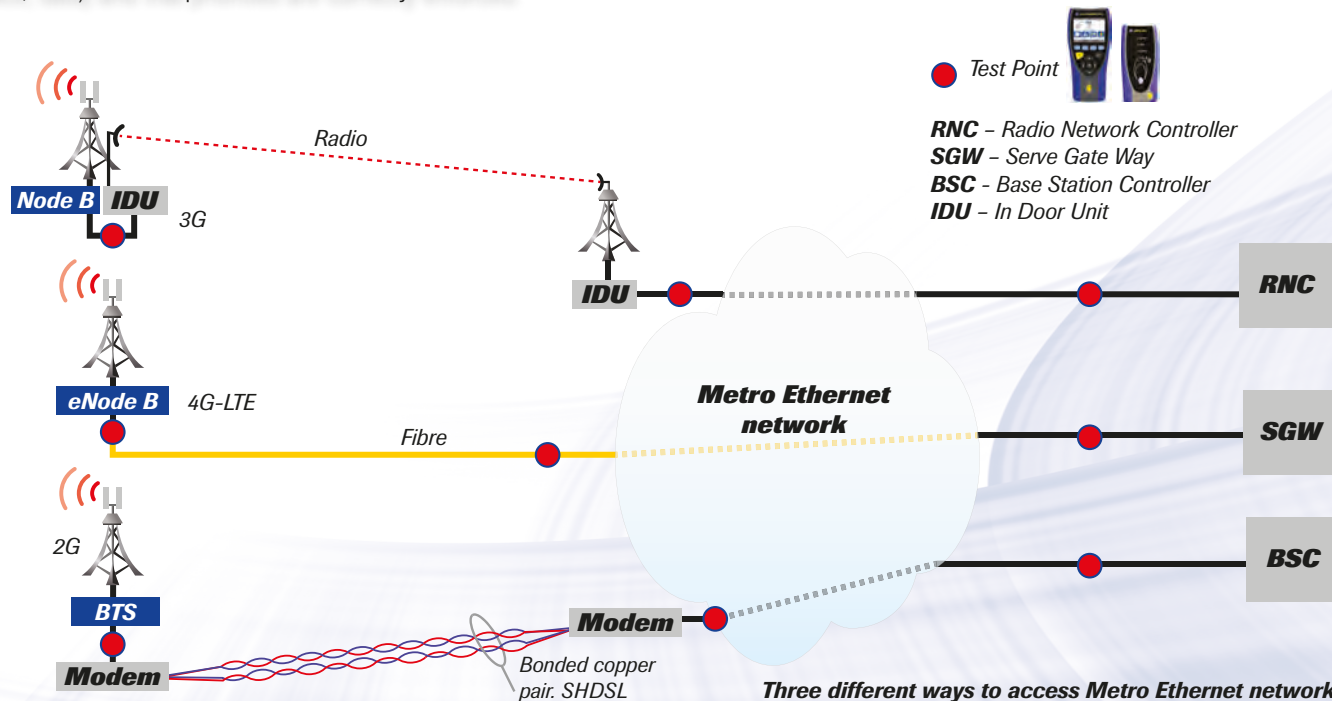
Duration (s) 61

Frame Transfer Delay (us)

Srv	FTD Min	FTD Mean	FTD Max
1	5	5	13
2	9	9	13
3	5	5	13
4	5	5	13
5	5	5	13

MORE

Multiple Concurrent Service Streams with nested VLANs under test



Small Cell / Microcell - Backhaul Link and PoE Test

Street Furniture | Wall mounted | In-building

UniPRO MGig1's

- SLA-Tick and
- Y.1564 (NetSAM) tests

are ideal for bringing fibre, radio or copper links into service when installing small and micro cells.

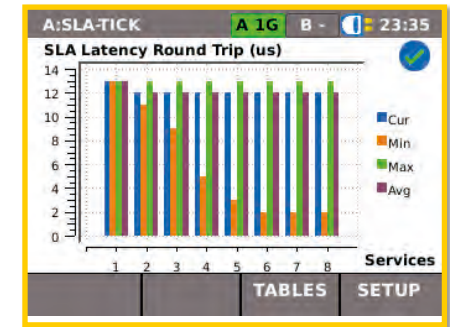
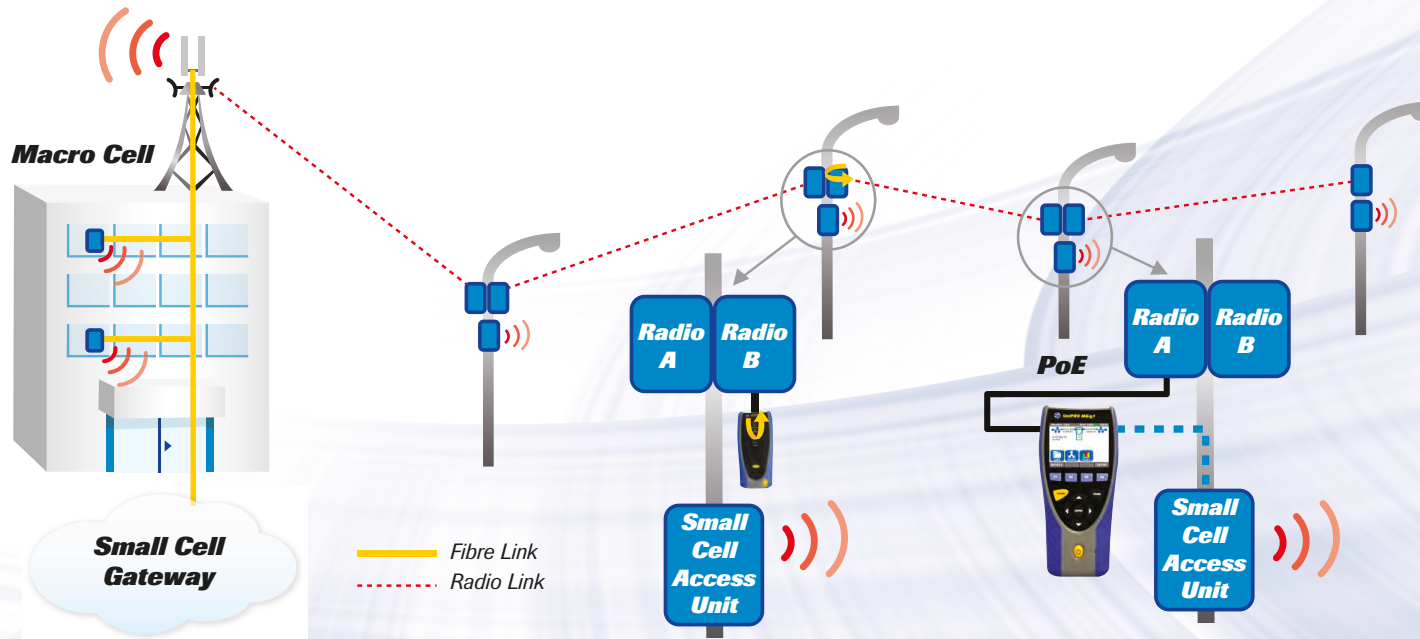
UniPRO MGig1 is unique amongst carrier-grade testers in offering

- PoE testing

of available voltage and power. Used in pass-through mode, it can display the cell's real-time power consumption.

- Top 10 bandwidth users test

shows the actual traffic on individual VLANs and cell users in through mode.



SLA-Tick test results

WiFi Access Point Turn-up and Maintenance

In-building | Outdoor

Use UniPRO MGig1's

- **SLA-Tick**

for performance assurance on the backhaul link.

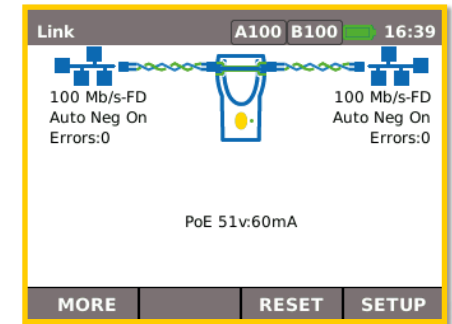
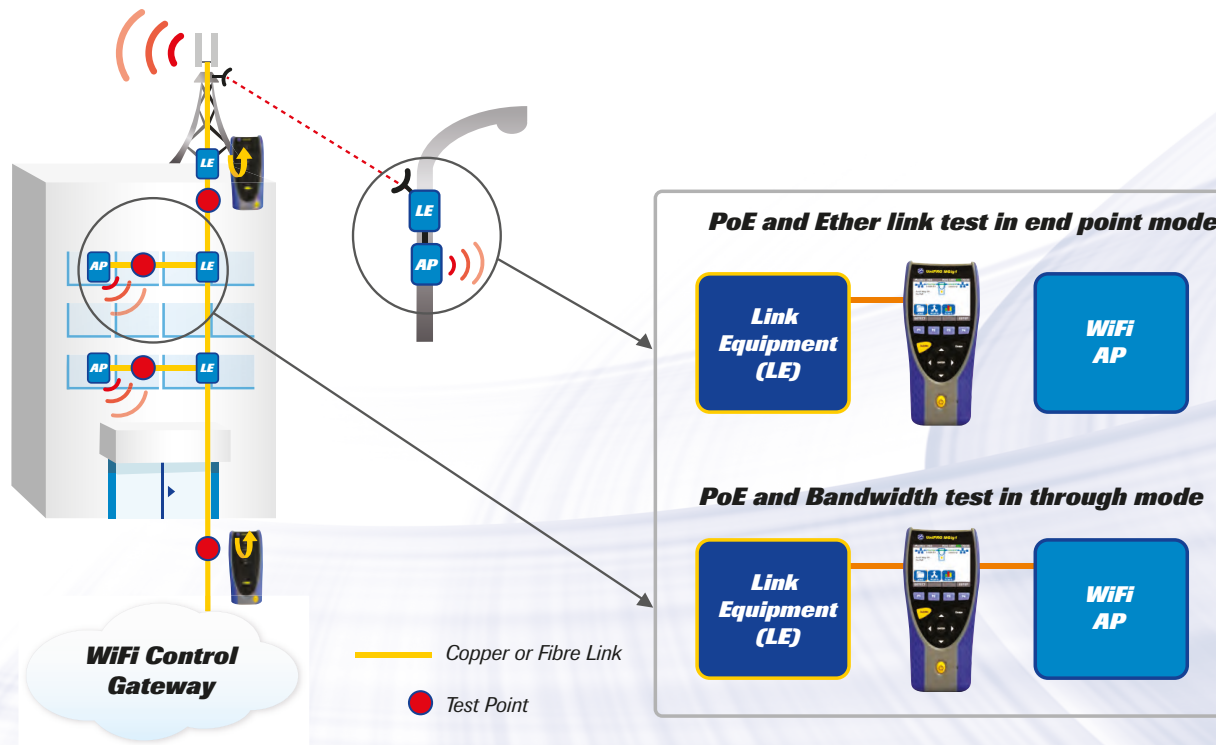
UniPRO MGig1 is unique amongst carrier-grade testers in offering

- **PoE testing**

of available voltage and power. Used in pass-through mode, it can display the cell's real-time power consumption and bandwidth usage.

Actual traffic for individual VLANs and cell users is shown by the

- **Top 10 bandwidth users test**



**Power Over Ethernet (PoE)
test results**

Carrier - Service Turn-Up

EPL - Ethernet Private Line

Point-to-point testing over SDH ring-topology networks is simple with UniPRO MGig1's conventional

- BERT test
- RFC 2544 tests

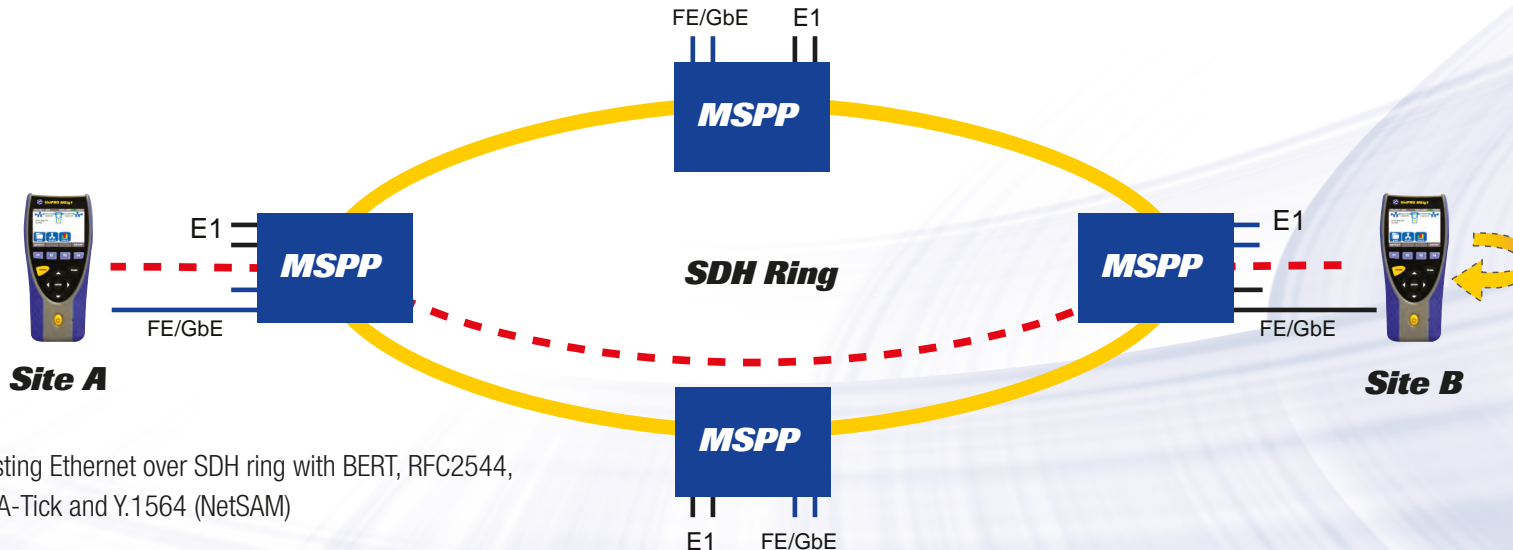
Performing advanced multiple concurrent service (stream) tests include

- SDT (Service Disruption Time)

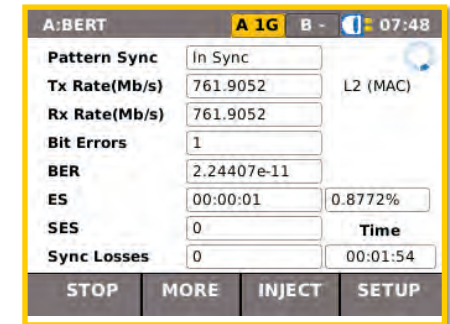
with up to eight streams and nested VLANs up to eight-deep with UniPRO MGig1's

- Y.1564 (NetSAM) test suite

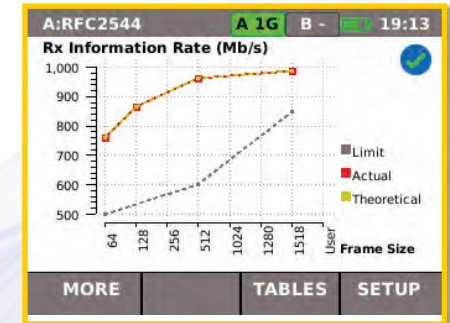
Use the cost-effective UniPRO SEL1 intelligent remote unit for loopback testing or a second UniPRO MGig1 tester for Bi-Directional tests. In both cases the far end unit is remote controlled - removing the need for a second engineer.



Testing Ethernet over SDH ring with BERT, RFC2544, SLA-Tick and Y.1564 (NetSAM)



BERT (Bit Error Rate Test) results



RFC2544 test results

EVPL - Ethernet Virtual Private Line

Point-to-point and point-to-multipoint testing of Ethernet Virtual Connections over fibre, copper (including xDSL) or wireless link is simple. Use a UniPRO SEL1 remote controlled intelligent loopback unit, or a remote controlled UniPRO MGig1 tester, at the far end - and a UniPRO MGig1 controlling them at the near end.

Only one engineer is needed to perform all the tests.

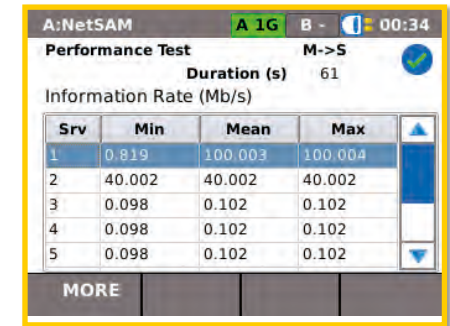
All tests in

- RFC 2544

can be performed from UniPRO MGig1 - plus the more advanced suite of

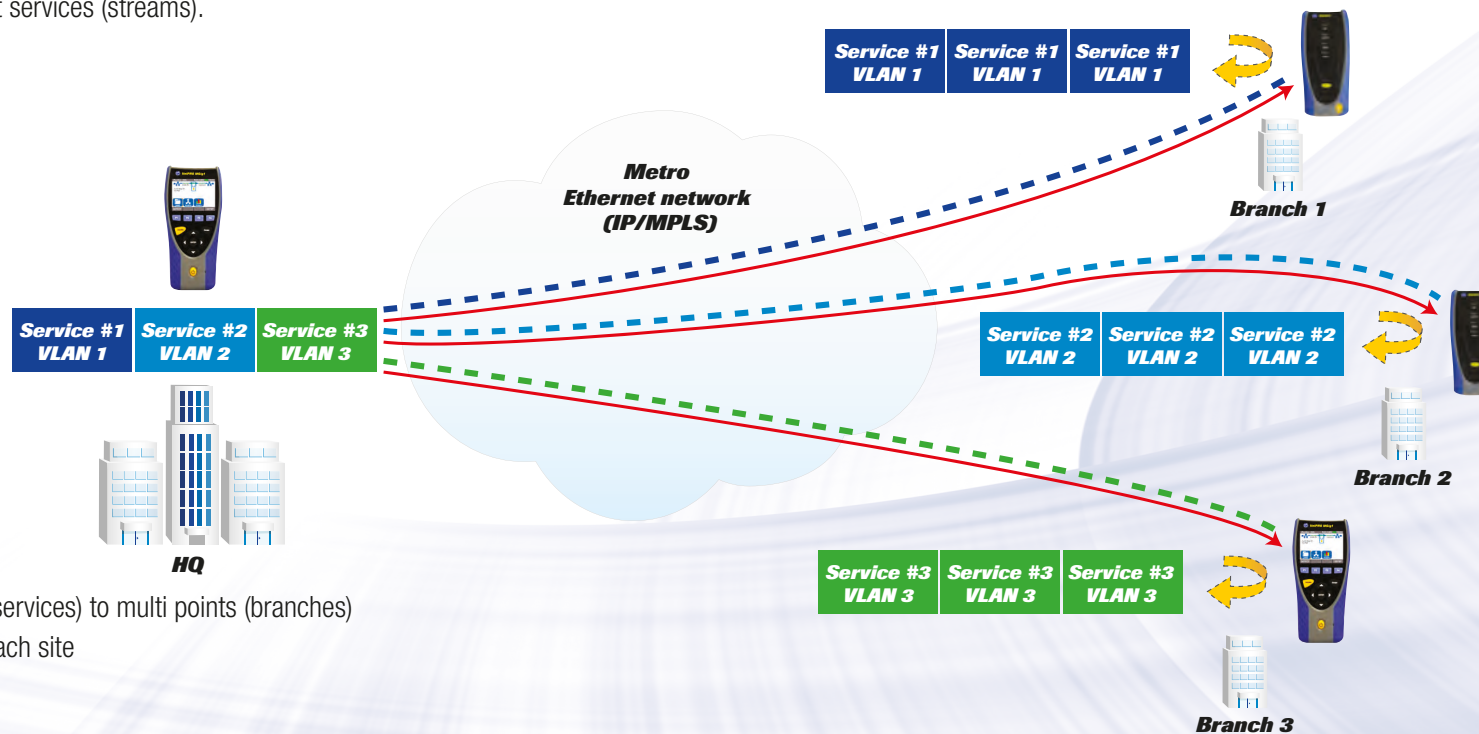
- SLA-Tick and
- Y.1564 (NetSAM) tests

with multiple concurrent services (streams).



A:NetSAM				
Performance Test				
			Duration (s)	61
Information Rate (Mb/s)				
Srv	Min	Mean	Max	
1	0.819	100.003	100.004	
2	40.002	40.002	40.002	
3	0.098	0.102	0.102	
4	0.098	0.102	0.102	
5	0.098	0.102	0.102	

**Bi-Directional Y.1564
(NetSAM) test results**



Test point HQ (multi services) to multi points (branches)
QoS with loopback each site

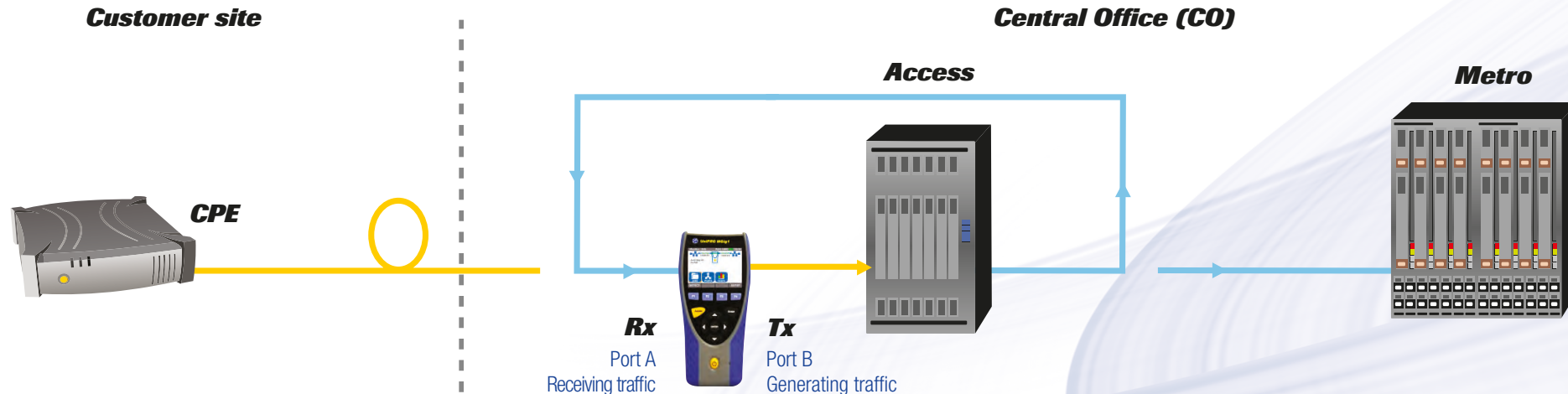
Provision Error-Check on Access/Edge Network Equipment for Service Turn Up.

Use UniPRO MGig1 to test that the network has been correctly configured for customer service turn-up. Perform

- **Priority label check** on QinQ or multiple VLANs, check Label, Class and TTL for MPLS plus Layer 3 QoS tags ToS and DSCP.
- **A single dual-port UniPRO MGig1** can test on port A whilst the Traffic Generator on port B can generate 'user' traffic for performance assurance of the configuration under check.



Checking VLAN priority set in Y.1564 (NetSAM) colour



Port B generates traffic to the access equipment and port A receives traffic to check provision errors of the configured services.

Carrier Troubleshooting

SLA Dispute Resolution and Bandwidth Up-Sell

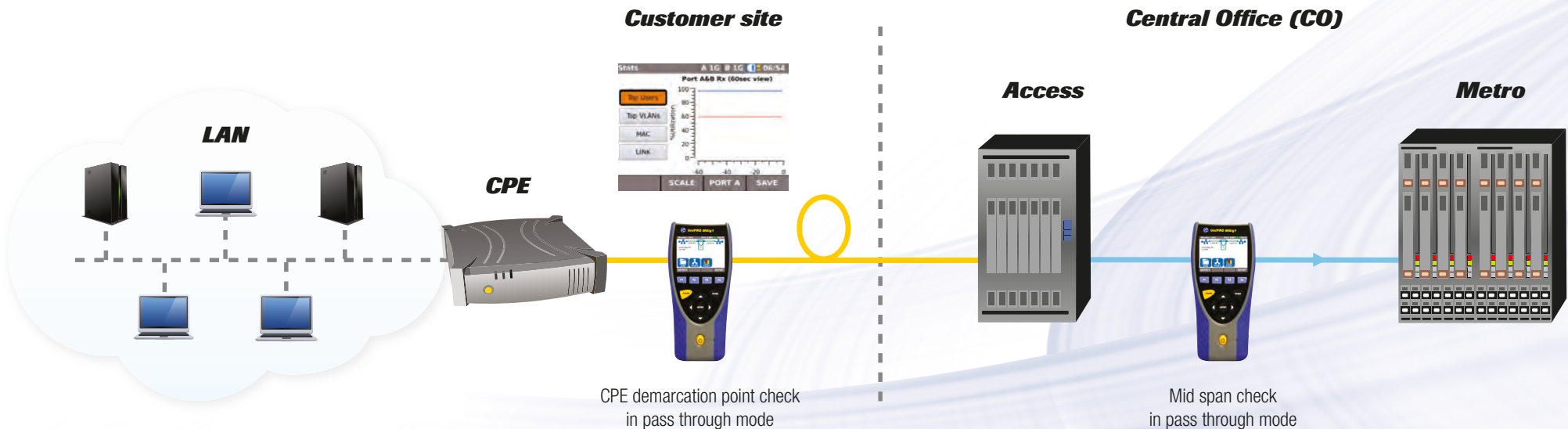
When a customer is challenging delivery under the SLA, or when you need to check that bandwidth regulation is operating correctly, UniPRO MGig1's

- **Top Ten Bandwidth Users test**

is ideal for checking the actual bandwidth being provided and which of the customer's 'users' (PCs or servers etc) are consuming the bandwidth. In many cases you'll be able to demonstrate that the customer has come to rely on EIR (excess information rate) traffic because usage has grown well past the CIR (committed information rate) level. UniPRO MGig1 gives you firm evidence and generates the opportunity to sell the customer a bandwidth upgrade.

VLAN		A 1G	B 1G	20:14
Top Ten VLANs 1 Sec				
	VLAN Id	Avg Mb/s		
1	10.20	1780.6954		
2	100.200	48.4200		
3	102	29.0520		
4	101	19.3680		
		30 SEC	RESET	

Multiple Concurrent Service Streams with nested VLANs under test



SLA dispute at demarcation point of customer site or mid span interface with other operators in CO by using real time traffic monitor and identifying top 10 bandwidth users via VLAN, MAC or IP address.

Network Priority Stress Test

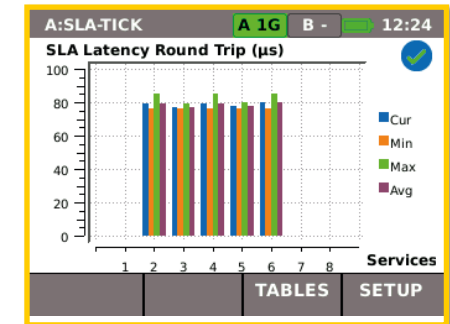
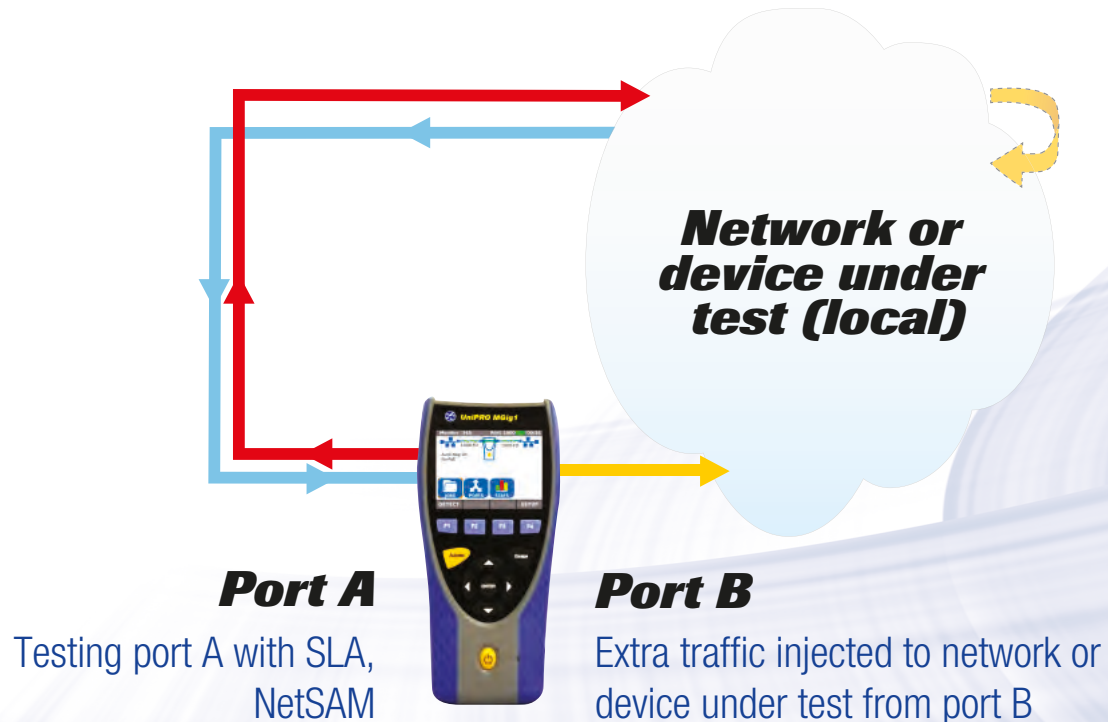
Are service (stream) priorities on the link under test correctly handled under the impact of excess network traffic? If not, customers could loose high priority traffic during network busy times.

UniPRO MGig1 allows you to be certain by performing a full multiple concurrent service (stream)

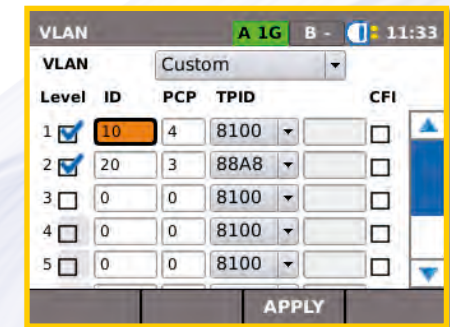
- **SLA Tick-Test on the link** - whilst using the instrument's
- **Independent Traffic Generator**

on its second port to inject additional traffic into the network.

UniPRO MGig1 checks delay, frame loss and other parameters to ensure that high priority packets are not impacted - whilst lower priority traffic is discarded in the correct order according to stream priority configurations.



Multi-stream SLA-Tick test with simple Pass/Fail results



A screenshot of the VLAN priority setup configuration. The title is 'VLAN' and the status is 'A 1G B - 11:33'. The configuration is set to 'Custom'. The table shows the configuration for 5 levels.

Level	ID	PCP	TPID	CFI
1	10	4	8100	<input type="checkbox"/>
2	20	3	88A8	<input type="checkbox"/>
3	0	0	8100	<input type="checkbox"/>
4	0	0	8100	<input type="checkbox"/>
5	0	0	8100	<input type="checkbox"/>

VLAN priority setup

UniPRO MGig1 and UniPRO SEL1

Key Facts

Compact, rugged and ergonomically designed for easy hand-held use UniPRO MGig1 is the affordable carrier-grade tester for any engineer or technical involved in service turn-up or troubleshooting.

Saves time on site

Many hours on site are spent troubleshooting network configuration problems and mis-patching within the network. UniPRO MGig1 gives you a suite of configuration tests that can frequently reduce time on site by half a day.

The ability to remote-control either the UniPRO SEL1 intelligent loopback unit or a second UniPRO MGig1 tester means that only one engineer or technician is needed for the vast majority of tests - even when the ends are on different continents.

Multiple tests can be pre-configured enabling a technician to run a full suite of tests from a single Autotest key by simply ticking the required tests.



- **Top 10 bandwidth users by LAN, IP, MAC**
- **Smart target detection and loop control**
- **Independent target and service setup**
- **SLA-Tick test with multi services**
- **Bi-direction test for Y.1564 (NetSAM) and RFC2544 - unmanned at far end**
- **Multi service test up to 8 services (streams)**
- **BERT test for Layer 1 to Layer 4**
- **VLAN, MPLS and ToS/ DSCP support**
- **IPv4 & IPv6 simultaneous support**
- **One press Autotest key for multiple test items**
- **PoE test**



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