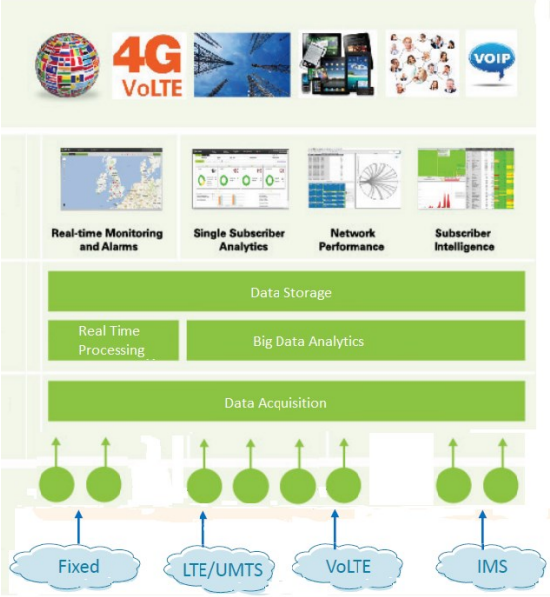
Extending network visibility from Core to Access

Fueled by the explosive growth of LTE data traffic, the need to reduce operating costs and the promise of new competitive services, VoLTE presents significant challenges for mobile network operators (MNOs) to both achieve their business objectives as well as meet the reliability and quality expectations of their existing 2G/3G circuit-switch voice subscribers.
Early deployments by leading MNOs show that deploying VoLTE and maintaining optimal QoE (Quality Of Experience) is a challenge. Real-time QoE monitoring of signaling and media is required to detect and diagnose issues affecting customer satisfaction and — ultimately — assure the successful scale-out of VoLTE services.



VoLTE analytics systems are usually connected into strategic interfaces in the evolved packet core (EPC), and they centrally see every VoLTE session to create a detailed picture of QoE over a wide range of dimensions: user, handset type, provider, cell site, codec, and more.
However, centralized visibility does not show the whole picture: visibility of all network domains that the VoLTE call passes is a key point. The interconnection with legacy networks has to be considered: typically, TDM connections are used in conjunction with LTE networks for Voice interconnection or Voice termination. In this case, for calls originating on VoLTE and breaking out to the CS (Circuit Switch) network, or using CS network for the interconnection between two VoLTE operators, TDM network have to be accessed to reconstruct complete network visibility. Every time a PS/CS conversion occurs, it may add delay, and potentially degrade the voice quality.

E-

The Challenge

For VoLTE, end-to-end correlation is applied to combine all the various legs comprising the voice, SMS or video session from the LTE radio interface to the IMS core. This correlation applies to on net IMS sessions as well as interoperability with legacy CS voice networks and LTE 3G fall-back (SRVCC).
Tapping key locations across CS network interconnection and TDM RAN interfaces is critical to localize VoLTE issues to their origin. The ability to troubleshoot the complete call path means that Operators can determine where call quality starts to degrade, and at what point impairments such as latency, packet loss and jitter are introduced.
From the above considerations, it is clear that a modern Service Assurance System has to include also the monitoring of the old CS legacy networks, at least in the critical points. On the other side operators are reluctant to invest in TDM tools, they know the legacy networks will be replaced soon or later, they would prefer to monitor the whole infrastructure using future proof IP monitoring tools.

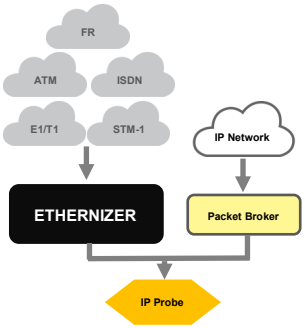
The Solution

Ethernizer E-613 B

Microtel's Ethernizer family products are the solution to this challenge, enabling operators to manage a mixed infrastructure with the same tools, bringing all-locations and all layers visible to the Centralized Monitoring System through the IP Probes, no matter if IP or TDM technology is used.

What does this product do

- Interfaces with TDM networks at physical level
- Performs message translation to IP format and gives output messages to 1G/19G interfaces
- With the new Voice&Signalling product it also encapsulates Voice Data into RTP protocol, so making possible to feed the IP probe both with TDM Signalling and Voice information.



Monitor TDM with an IP probe - Solution Brief

Ethernizer

A Telecom Operator cuts actual OPEX by 78% in 3 years

A major European Mobile Operator recently went through an heavy cost reduction process, driven by High Level Management, in particular focusing in OPEX reduction.
The original topology of their Service Assurance System was including several Probes, distributed across the network; 12 were TDM probes interfacing STM1 links. A first attempt to reduce OPEX costs was to renegotiate the annual maintenance costs for these TDM probes, but it couldn't go under 260.000€ for all 12 probes for 3 years, due to the high maintenance costs of these old technology probes. This was absolutely not in line with the cost reduction target decided by the High Level Management.
Moreover, the Network Engineers were worried about the risks associated with keeping alive these legacy Probes, since they were planned to go out of life in a couple of years.

THE SOLUTION

The Customer decided to look for a different strategy, with the goal to effectively achieve a huge and sustained OPEX reduction.
The decision was to buy Microtel Ethernizers to replace the existing TDM probes, so converting TDM traffic to IP and feeding existing IP Probes. In case the Ethernizers were not colocated with the IP Probes, an IP Backhaul have been configured to connect the two devices.
Twelve Microtel Ethernizers have been purchased, to replace the TDM probe, for a total price of 192.000€. The yearly maintenance cost is 19.000€, for a total cost of 230.000€ in 3 years (considering that the first year is covered by warranty). As a consequence, instead of spending 260.000€ for 3 years OPEX, the Operator decided to buy twelve Ethernizer, for a total 3 year cost of 230.000€, so saving 30.000€ in 3 years and cutting the yearly OPEX from 86.000€ to 19.000€, a 78% savings

	Cost per the first 3 years	Cost per additional year	OPEX cut by
TDM probes	260.000€	86.000€	-
Ethernizer	230.000€	19.000€	78%

A Telecom Operator cuts CAPEX by 67% and OPEX by 78%

A major European Mobile Operator recently took the decision to upgrade its Test and Monitoring System to include additional legacy network links, to couple with existing troubleshooting issues, in particular due to interconnection network, and to be ready for VoLTE deployment.
The original topology called for 26 Probes distributed across the network, one for each site. In addition to them, the Network Engineering Dept planned for at least 6 additional TDM probes, to interface STM1 links, some of them to be deployed co-located with the existing IP Probes, the others in remote sites, to ensure all critical monitoring aspects are covered.

The capital expenses associated with the additional TDM monitoring Probes was 293.000€: this expense was completely out of the allocated budget.

THE SOLUTION

With the Microtel Ethernizer, the customer was able to create a future proof network monitoring strategy with complete network visibility and all at a cost that was under budget. Using Microtel Ethernizer to interface the legacy links allowed Network engineers to use the current IP Probes, in case configuring an IP backhaul to connect the Ethernizer output data to the IP Probe if it was not colocated.
The net result of choosing the Microtel Ethernizer was to extend the monitoring system at a fraction of the cost. Instead of the 293.000€ required to purchase the 6 TDM Probes, the Operator bought 6 Ethernizer for less than 100.000€, a 67% savings.
As an additional benefit, annual maintenance costs went down from 43K per year to 9K per year.

	CAPEX	CAPEX cut by	OPEX (per year)	OPEX cut by
TDM probes	293.000€	-	43.000€	-
Ethernizer	96.000€	67%	9.600€	78%

The Ethernizer Product Family

Model	Input Physical Interface		Output Physical Interface	Protocol Conversion
E-613A	up to 128	E1	2x1G+2x10G Ethernet	SS7 (HDLC) to SIGTRAN
E-613B	up to 16	STM-1	2x1G+2x10G Ethernet	SS7 (HDLC) to SIGTRAN
F-353E/T	up to 128	E1/T1	2x1G Ethernet	SS7 (ATM) to SIGTRAN
F-353F	up to 4	STM-1	2x1G Ethernet	SS7 (ATM) to SIGTRAN
F-352E/T	up to 128	E1/T1	2x1G Ethernet	Gb-over-FR to Gb-over-IP
F-352F	up to 4	STM-1	2x1G Ethernet	Gb-over-FR to Gb-over-IP

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