

P&TLUXEMBOURG TRANSFORMS A LEGACY DSL COPPER INFRASTRUCTURE INTO A HIGH PERFORMANCE, ULTRA HIGH-SPEED NETWORK

ALCATEL-LUCENT PROVIDES A COST EFFECTIVE, INTEGRATED LINE TESTING SOLUTION TO ENSURE QUALITY AND STABILITY REQUIREMENTS FOR HIGH SPEED SERVICES



P&TLuxembourg is the leading provider of postal and telecom services in Luxembourg and is the fifth largest national employer with over 3,500 employees. Its telecom division runs fixed and mobile networks whose voice and data services include IPTV over DSL and FTTH, and satellite uplinks. In 2002, Alcatel-Lucent proposed a win-win collaboration for field testing and validation of a carrier-grade DSL line diagnosis, analysis, and optimization solution to address QoS concerns and higher customer call volumes.

CHALLENGES

- Lack of visibility on problems at the DSL layer (historical and realtime data missing)
- Copper-pair related faults impacting VDSL2 performance
- Difficulties with pre-qualification of a copper loop for DSL service
- Increasing OPEX from deploying field engineers to customer sites
- Unstable DSL connections resulting in poor Quality of Experience (QoE) and customer complaints

SOLUTION

- Network Analyzer – Copper: a comprehensive line testing, diagnosis and optimization solution for DSL networks
- Pro-Active maintenance through continuous monitoring
- Optimal line stability and quality through automated line profile configuration

BENEFITS

- Accelerated time to accurate troubleshooting
- Minimization of service downtime
- Complete, real-time view of the DSL layer
- Dynamic line management to proactively guarantee the stability of the line for the highest possible profile
- Dramatic reductions in OPEX – through reduced field interventions and Help Desk calls
- Improved customer QoE from stable, reliable, high quality services
- Empowerment of Help Desk to solve a wider range of problems and make the right decisions on the first customer call

THE CHALLENGES

Service providers face several hurdles when running very high speed digital line 2 (VDSL2) and broadband over a copper wire infrastructure. High speed applications, including triple play, demand line stability, forcing providers to operate DSL lines closer to their bit rate. This can result in loops of inferior quality, cross talk between lines, reflected signals that become noise, poor pair balance, and other factors that can impact DSL, producing slower speeds and service degradation.

In 2002, as DSL subscriptions increased, P&TLuxembourg also experienced more customer complaints signalling a potential Quality of Service (QoS) problem within its DSL network. For P&TLuxembourg wringing every ounce of performance from its legacy DSL copper infrastructure was critically important: in Luxembourg, 86 percent of all broadband connections and all local exchanges are DSL based. In addition, as the incumbent provider, P&TLuxembourg had established a corporate brand that stood for reliability and stability: any reduction in service quality was a serious problem.

With no visibility on the nature of “last mile” POP problems, P&TLuxembourg was forced to respond to customer complaints with the costly deployment of field engineers. “At that time, we had no idea what was happening in the network on the copper line at the DSL layer as well as no view of customer line behavior,” admits Serge Eiffes, Head of Access Networks.

Before experiencing further OPEX increases, and revenue loss through customer churn, P&TLuxembourg made the pre-emptive decision to conduct integrated line testing on its copper network. A solution was required for accurately testing, diagnosing and correcting line problems to enable better rollout decisions while ensuring the performance level required from DSL for stable high-speed, high ARPU services.

WHY ALCATEL-LUCENT?

Quality and trust were the two overriding factors in P&TLuxembourg’s decision to work with Alcatel-Lucent on a solution to identify line problems and ensure high quality broadband services. “Alcatel-Lucent’s experience with advanced DSL services and global telecom leadership made it the ideal partner for this project,” says Eiffes. Alcatel-Lucent has one of the most experienced global services teams in the industry and is a recognized market leader in broadband access with operations in more than 150 countries.

Significantly, Alcatel-Lucent also proposed an innovative “win-win” relationship with P&TLuxembourg: one that would address and solve P&TLuxembourg’s DSL quality and stability problems while confirming the carrier-grade readiness of the new Network Analyzer – Copper (NA-C). The opportunity enabled P&TLuxembourg to collaborate with the Alcatel-Lucent global R&D team and ensure the solution addressed their specific analysis and troubleshooting challenges. Similarly, Alcatel-Lucent benefited from the critically important opportunity to test Network Analyzer in a live, multi-vendor network. “We had a good relationship with the Alcatel-Lucent team,” comments Eiffes. “Together, we had the right technical know-how. They had a comprehensive product roadmap. And they were a market leader in DSL. We were confident this approach was the right way to go forward.”

THE ALCATEL-LUCENT SOLUTION

The collaboration resulted in a close working relationship that resulted in extensive live field testing and validation of NA-C’s line testing and diagnosis algorithms. The collaboration with P&TLuxembourg demonstrated the market readiness of NA-C: a carrier-grade, DSL line diagnosis, analysis, and optimization solution for multi-vendor copper networks.

Today, Network Analyzer – Copper is in release 8.0 and has a proven track record for reducing DSL line operating expenses by up to 50 percent and helping service providers ensure DSL lines meet stringent quality and stability requirements for the successful deployment of high-speed Internet and triple-play services. Key features of this access network troubleshooting and management solution — tested and proven in the live P&TLuxembourg network — include:

- Network-wide line quality assessment – allows operator to assess network performance and intervene where necessary
- Accurate line pre-qualification and upgrade qualification – providing the means to offer the best service to the customer
- Dynamic profile management enables advanced line optimization
- On-demand and routine line quality inspections provide advanced tools to remotely and quickly determine the cause of problems
- Non-intrusive in-service monitoring enables detection of intermittent problems
- Proactive network maintenance through binder-aware diagnosis results in more effective prequalification and troubleshooting and allows proactive repair, which avoids excessive repair costs, Help Desk calls, dissatisfied customers and also reduces churn
- Simplified diagnosis for Level 1 customer support
- Single-Ended Line Testing (SELT) and Dual-Ended Line Testing (DELT) enable troubleshooting of various connectivity problems, including detection and localization of open circuit and short circuit faults and powered down CPE detection
- Forced SELT allows fault localization when a line is in showtime
- Narrowband line testing (NBLT) for POTS service troubleshooting, including Metallic Line Testing (MELT) for DSL lines troubleshooting
- Advanced problem root-cause analysis based on expert systems and knowledge bases

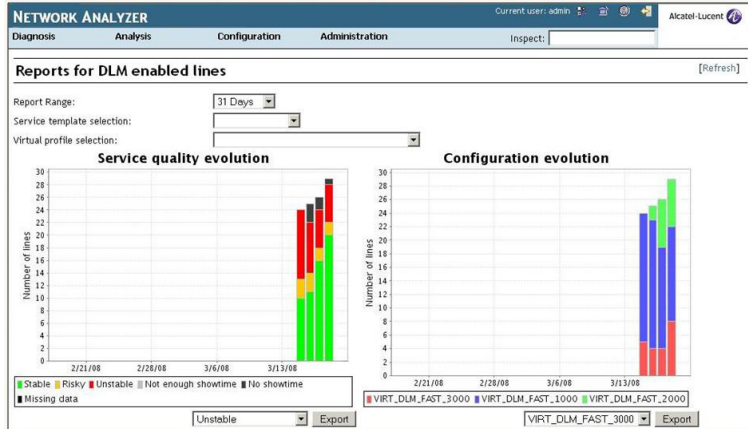
- Frequency Interference (RFI), impulse noise, crosstalk, CPE interoperability and bridge tap related issues
- Identification of various connectivity problems, including detection and localization of open circuit and short circuit faults and powered down CPE detection
- Support for bonding groups for XDSL & IMA for SHDSL ports allows the CSR to quickly diagnose a customer's 'line' and identify the issue by running an analysis in parallel on all the physical lines the bonding group contains
- Expert repair advice, including virtual noise and artificial noise repair advice
- Impulse noise histogram functionality

Network Analyzer supports these copper access technologies:

- ADSL, ADSL2, ADSL2 + all Annex A and Annex B, Reach extended ADSL (READSL2), symmetric high-speed DSL (HDSL), VDSL, VDSL2, bonding VDSL2 and POTS

THE BENEFITS

P&TLuxembourg was equipped with an exhaustively tested solution that enabled them to manage loop quality and ensure that DSL loops met quality and stability requirements for high bandwidth, real-time services. The Alcatel-Lucent Network Analyzer – Copper product provides a complete set of end to end (E2E) line management capabilities that addresses the full lifecycle of DSL lines. This includes pre-qualification, optimization, proactive maintenance, customer support and troubleshooting on a wide range of faults. “Network Analyzer has helped us develop a single, integrated approach to meet various technology needs, while performing critical tasks such as troubleshooting and proactive network diagnosis and management,” confirms Eiffes. “We are now able to avoid, anticipate or quickly resolve loop quality problems.”



Network Analyzer is easily integrated into an existing infrastructure and provides real-time visibility on a range of service performance issues.

Operational expenditures have also been reduced. Instead of deploying technicians to customer sites, P&TLuxembourg engineers now effortlessly and efficiently troubleshoot issues remotely. “We have certainly reduced truck rolls and problem escalation through remote intervention,” confirms Eiffes.

The ability for Help Desk professionals to remotely diagnosis DSL performance issues using a single, simplified network view has been a particularly powerful benefit. Line diagnosis information is immediately available through a single view of the customer situation. “The product has given us the ability to provide proactive, in-service line quality monitoring and take advantage of real-time line monitoring to detect any instabilities and degradations,” adds Eiffes. The net result is a proactive approach to access network management that has improved customer satisfaction, reduce Help Desk calls while increasing First Call Resolution (FCR).

The Dynamic Line Management (DLM) features of Network Analyzer – Copper also provided powerful benefits. Bandwidth-intensive services such as multistream HD IPTV on VDSL2 add

management complexity as increases in line bandwidth that can result in poorer quality of service. The goal of DLM is to guarantee the quality and stability of the customer’s line for the highest possible DSL profile parameters. Network Analyzer’s DLM capabilities enable P&TLuxembourg to proactively detect and automatically localize line degradations while adjusting settings. It can also predict maximum line performance more accurately — resulting in a more efficient, higher quality of service with reduced downtime and faster problem resolution.

SUMMARY

P&TLuxembourg is well positioned to meet the demand for more speed while providing stable services with lower operational costs through optimized lines, while proactively trouble shooting on a range of issues. More than anything, P&TLuxembourg has realized the full benefit of its copper infrastructure — and can deploy high bandwidth services with complete confidence. “Network Analyzer – Copper has enabled us to maximize the performance of our copper DSL infrastructure and ensure it delivers the quality of service our end customers have come to expect from P&T Luxembourg,” confirms Eiffes.

BUSINESS PARTNER

In 2002, Alcatel-Lucent and P&TLuxembourg saw an important market opportunity for both companies to collaborate. In a very real way, the business partnership that resulted confirmed the market readiness for Network Analyzer – Copper. Both companies realized important benefits and forged a special business relationship that continues to this day. The algorithms that were field-tested as a result of this important collaboration have since been thoroughly time-tested and fine-tuned with progressive new releases and powerful features to meet the evolving needs of service providers. To date, Network Analyzer – Copper has been deployed by over 100 of the world’s leading service providers.

www.alcatel-lucent.com Alcatel, Lucent, Alcatel-Lucent and the Alcatel-Lucent logo are trademarks of Alcatel-Lucent. All other trademarks are the property of their respective owners. The information presented is subject to change without notice. Alcatel-Lucent assumes no responsibility for inaccuracies contained herein. Copyright © 2012 Alcatel-Lucent. All rights reserved. M2012022024 (February)