

A new approach to ITS infrastructure migration

Actelis Networks' new approach resolves today's challenges of enhanced road safety monitoring and control, integrating legacy and new IP systems at close to zero implementation delay and cost

30

The number of camera locations that can be served in a single ring with real-time high-quality video thanks to Actelis hybrid solutions

The promise of fiber connectivity is to many organizations an easy one to justify, and in most cases the change is simple with only a few connections needing to be upgraded in the HQ and regional offices, but how do you approach the challenge if you have thousands of miles to cover and tens of thousands of connections? That's exactly what countries and cities looking to upgrade their ITS networks must address.

The challenge

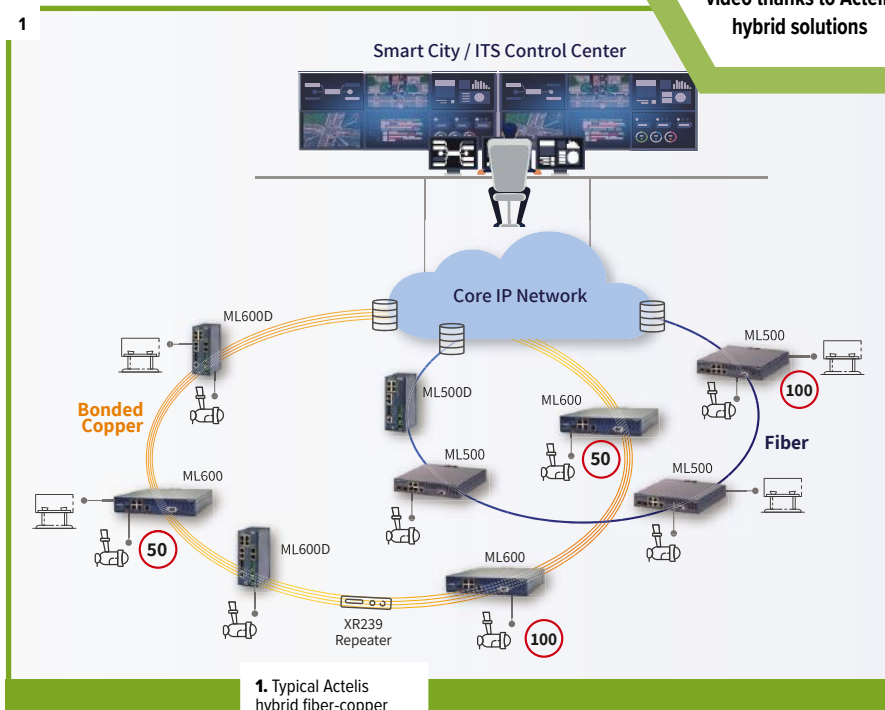
A typical ITS networks is stretched across thousands of miles of roads and highways, and maintains a telecommunication networks that links tens of thousands of roadside assets such as signs, signals and cameras, to multiple control centers (regional, city or national).

Many of these networks need transformation and modernization that would allow them to support and deliver the new IP-based services and advanced video monitoring across a faster, reliable, resilient and secure communications infrastructure. This new network is also expected to be future-proof, enabling support for car wi-fi, vehicle-to-everything (V2X) communication and more.

Ideally, a new ITS network should be deployed using fiber links, with any legacy links also upgraded. However, this shiny new world of connectivity is not available everywhere and, may not be for some time. In fact, in many cases that Actelis experts have been involved in, between one-third and half of a network has relied on legacy copper links.

This presents some serious technical challenges. Teams must marry existing copper and new fiber networks without compromising service levels, reliability or security.

The list doesn't stop there; both fiber and copper connections must still provide reliably high bandwidths (over extremely long distances) in both ring and linear add-drop topologies while connecting to IP or legacy equipment.



1. Typical Actelis hybrid fiber-copper smart city network

2. The Actelis ML6XX range of roadside hardware

The solutions

Actelis along with its many ITS/smart city partners worldwide is a supplier of a special breed of communications magic. Actelis offers a solution that allows the ITS operator to maximize the use of the available infrastructure by using fiber connectivity, where available, and the existing copper infrastructure where fiber is not deployed. This allows operators to quickly and cost-effectively migrate to a full IP network utilizing a hybrid scheme to provide the advanced functionality required over both fiber and bonded copper.

Actelis' secure, hybrid architecture includes high-density compact fiber and bonded copper switches and remotely powered smart repeaters which enable fiber-like service over long copper cables supporting ring, add-drop and linear deployment architectures irrespective of the infrastructure.



“OUR UNIQUE APPROACH LEVERAGES CUSTOMERS’ INVESTMENT IN THEIR EXISTING FIBER AND COPPER TOPOLOGIES, HAS INCREASED THEIR COVERAGE AND CONTROL OF ROAD SYSTEMS, ALL AT NO EXTRA COST. THIS AND OUR ABILITY TO INTEGRATE WITH A WIDE VARIETY OF MANAGEMENT SYSTEMS IS WHY CUSTOMERS ARE CHOOSING ACTELIS NETWORKS.

Tuvia Barlev, CEO, Actelis Networks

The equipment is installed in both standard temperature-controlled 19in racks and non-temperature controlled roadside cabinets with limited space. Actelis offers both compact DIN rail as well as 19in rack solutions that can be flexibly used per scenario to ensure required functionality with minimum footprint.

Advanced quality of service (QoS) functionality ensures sensitive applications, like CCTV, have highest priority with minimum delay and delay variation. Thus, even in a large ring with as many as 30 locations, real-time high-quality video can be transmitted, allowing the control centers to quickly identify any safety issues and initiate the required response – e.g. first-response teams in the case of an accident; or route alterations to alleviate congestion, updating smart signs in real-time to alert traffic to changing conditions or hazards on the road, etc.

The right hardware

In order to meet stringent SLA requirements, and to efficiently monitor and manage Actelis’ equipment, Actelis’ MetaASSIST EMS is deployed. With zero touch provisioning (ZTP) and scheduled tasks, new installations and global provisioning changes are extremely simple, and maintenance and troubleshooting tasks can be performed efficiently and remotely.

The MetaASSIST EMS provides a user-friendly interface to enable easy monitoring of alarms, and is simple to integrate into the existing alarm-management systems via the EMS’ Northbound interface, which allows control centers to monitor a single system for alarm management. The MetaASSIST EMS can also monitor other non-Actelis, third-party devices which provides the additional benefit of monitoring end equipment (CCTV cameras, etc.), without the need for additional management platforms.

Network security, cyber-protection and advanced troubleshooting tools are high priority requirements for the network. Actelis’ hybrid fiber-copper network meets this challenge, providing extensive functionality in

Exceeding all requirements

Actelis Networks is a specialized market leader in high performance hybrid Fiber-Copper connectivity solutions for the ITS and smart city markets

ITS networks upgrade requirements

- Connectivity: hybrid copper-fiber
- Topologies: flexible, rings, add-drop, long reach
- Highly reliable and secure links
- Optimized for advanced monitoring, IP and video
- Interoperability with existing network, legacy support
- Full remote management
- Limited Space – highly compact design.
- Future-proof, flexible infrastructure

Actelis products deployed include...

- ML500x – Advanced fiber switch providing multiple gigabit connectivity over ring and linear topologies. DIN rail and rackmount versions

- ML600x – High-speed bonded copper switch providing fiber-like service over ring, add-drop and linear topologies. DIN rail and rackmount versions

- XR239 – Remotely powered smart repeaters providing extended reach over bonded copper. Up to nine hops

- MetaASSIST EMS (element management system) – Advanced management platform offering easy-to-use, simplified management with zero touch provisioning, scheduled tasks, and seamless integration into existing networks

Results and benefits

- End-to-end flexible architecture with zero infrastructure migration
- Highly secure network
- Seamless upgrade to all-fiber network
- On time, within budget
- Interoperability, legacy and IP support
- Seamless management integration
- Easy fit into existing cabinets

both areas. Both the network and management platforms offer a high-speed, reliable and cyber-protected solution, which can connect to both IP and also legacy SCADA devices, while delivering the applications required for a smart motorway network.

So that’s how you do it!

The goal of providing a modern IP infrastructure to an organization with a huge footprint and multiple legacy connection points was always going to be a huge challenge. However, Actelis has demonstrated it is possible to successfully plan and roll out hybrid networks to bridge the

gap between copper and fiber. Not only can you fix the holes, but networks can flex with a client’s needs over time. The Actelis products provide fiber connections where possible, high-speed copper where not, and still preserve an easy zero-migration upgrade when needed, delivering a truly future-proof network. ☒

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