Actelis Networks

Railroad Enhances Communications Network and Safety With Actelis Networks

Gets More Reliable Bandwidth To More Places Over High Performance Ethernet Over Copper, Enabling Positive Train Control, Diverse Access, plus WiFi and Radio Communications With Crews

A regional railroad transports close to half a million passengers and millions of tons of freight each year, providing a vital link between cities and towns. All while braving extremely challenging environmental conditions and terrain spanning some very remote sections of country.

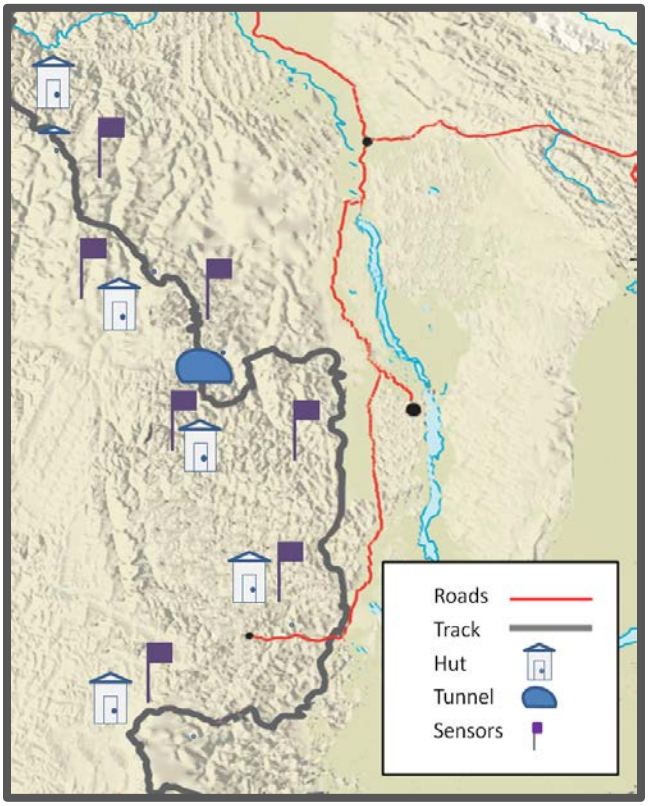
This railroad operator needs to make sure that they operate the railroad safely and efficiently, and to do this they need to maintain a state of the art communications network at all times.

The Application

Keeping track of the location and speed of trains as well as their position with respect to schedule is extremely important for all railway networks. This is true not just because timely delivery is critical in the freight business, but since passengers expect the trains to run on schedule. It is also a matter of safety.

Positive train control (PTC) systems are currently being deployed throughout the main rail line by railway operators worldwide. PTC networks integrate sensors, communications, and automated processing. They ensure that trains are where they should be at any given point in time, and that they are moving at the proper pace. This prevents collisions and derailments, and ensures that progress is not being impeded by track damage, tunnel blockages or mechanical failures.

In the U.S., the Rail Safety Improvement Act of 2008 (RISA) mandates that PTC networks must be deployed in all Class I railroad main lines carrying commuter or inter-city passenger traffic, or poisonous-inhalation-hazardous (PIH) materials.



This Actelis customer is proactively complying with the 2015 deadline in North America mandating that PTC systems to be fully operational.

The Application

The railroad operator has environmentally challenging sections of track where they needed to deploy faster communications in support of PTC, but faced particular challenges from avalanches, landslides, and blizzards. They had three key requirements for a network solution: 1) More bandwidth, 2) Utmost reliability, and 3) The use of diverse access media including copper as well as fiber and microwave.

First, more bandwidth was required because support for PTC required connectivity at additional locations at a number of sites. The network now has to support location, speed and vibration sensors at more locations, plus support WiFi access points which backhaul for radio communications used along the line by work crews as well as for communicating with train systems and crews.

In the past, the network had supported only 6 Mbps of bandwidth, which was delivered over 4 T1s using the 8 available pairs of copper. But now 10 Mbps+ of bandwidth was needed, and a solution making more efficient use of their copper was required.

Second, absolute reliability was a must for the railway operator, because PTC is a mission critical application that affects safety as well as the profitability of operations. Monitoring and controlling the location and speed of trains and understanding the conditions of track and tunnels is key to avoiding potential collisions and derailment. It is also necessary to keep the trains running on schedule, in compliance with PTC regulations, and without incurring the speed penalties imposed when network connectivity is lost.

Last but not least, diverse access including copper as well as fiber and microwave was essential. Sections of this railway operator's track pass through some very remote locations where landslides and avalanches are frequent, and where Ice storms and blinding snowstorms featuring driven wet snow can occur.

As a result of these environmental challenges, both fiber and microwave communications in the network can and do go down. Having copper as a diverse access media is an absolute must for safety, timely operations, and to avoid penalties.

The Solution

Actelis Networks' ML628 Ethernet access switches and XR239 repeaters enabled this railway to achieve between 11 and 14 Mbps per segment to the 8 remote sites along this 60 mile section of track, doubling bandwidth without requiring additional pairs. The equipment for this solution is housed in track-side pedestals, cabinets and huts.

The Actelis Ethernet access switches use EFM (Ethernet First Mile) over Copper and standards-based G.SHDSL technology. Bonding multiple copper pairs, they employ Actelis' innovative, patented EFM*plus*™ suite of advanced copper transmission technologies. EFM*plus*™ makes getting more bandwidth out of each copper pair and doing so over greater distances easy, while creating stable performance and highly resilient links.

The Value of Actelils to This Railway Operator

"Actelis gives us an extremely reliable solution to get all the bandwidth we need out to a number of challenging, remote locations using existing copper."

"The Actelis solution stays up and running, offering good throughput even over low quality copper or if a pair happened to be damaged. And it gives us the diverse media we need to increase network reliability in support of PTC and safe and efficient railway operations."

Actelis ML628

- EFM over Copper
- Bonds up to 8 pairs
- Up to 15 Mbps per pair
- Environmentally hardened

Actelis XR239

- Repeaters for long distance applications
- Up to 9 hops per link