Croatia's Terrestrial Trunked Radio System Backbone Realized With Eclipse

The Challenge

The Croatian Ministry of the Interior (MUP) and the Zagreb Public transportation system (ZET) required a reliable, future-proof backhaul solution for their Terrestrial Trunked Radio system (TETRA).

The Solution

Harris Stratex Networks, in conjunction with their regional partner MICRO-LINK , implemented Eclipse for the TETRA backhaul. This provided MUP and ZET with the most advanced technology available for microwave communication systems.

By using Eclipse S-PDH rings, the quantity of microwave equipment required for the network is reduced by almost half, compared to conventional point-to-point microwave links.

The Result

The Eclipse microwave system was recognized by MUP and ZET as a reliable, robust, and flexible solution. Installed, it has realized fully protected radio links for them, at a significantly reduced cost compared to other options, while satisfying their current and future demands for their TETRA backhaul networks.

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Introduction

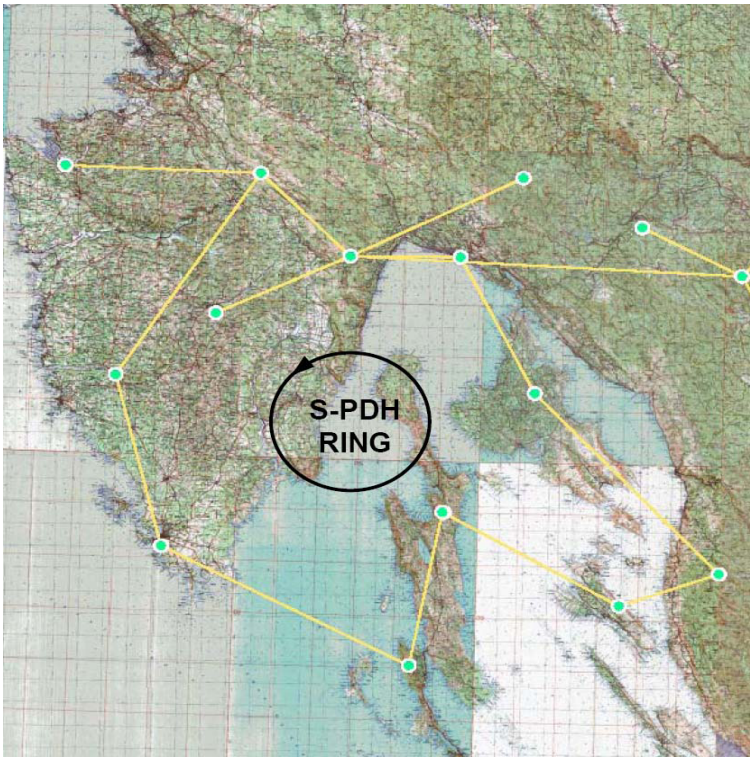
In the Republic of Croatia, the Ministry of the Interior (*Ministarstvo Unutarnjih Poslova*, MUP) and the public transportation system for the city of Zagreb (*Zagrebacki Elektricni Tramvaj*, ZET) both implemented a TETRA (Terrestrial Trunked Radio) mobile networks. MICRO-LINK, a wireless communications provider, used Eclipse microwave radios to provide an advanced backhaul solution for these networks.

Until recently, MUP and ZET were using a traditional analogue PMR system. They both decided to replace the outdated analogue voice networks with standardized TETRA systems. TETRA networks meet high standards for availability and security and enable all types of radio connections (data and voice). The TETRA standards, adopted in Europe in 1995, are used for radio networks in the 380 to 400 MHz and 410 to 430 MHz bands. For the MUP and ZET TETRA networks to reach their full potential, it required a flexible system backhaul that supported all TETRA features. MICRO-LINK proposed Eclipse as a backhaul solution.

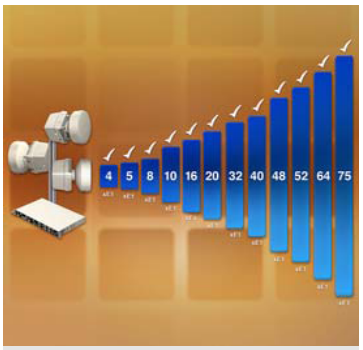
Eclipse Provides Flexible TETRA Backhaul

For the TETRA backhaul, Eclipse is the ideal solution, ensuring a fully protected transfer of information between the TETRA base stations. Now MUP and ZET can benefit from their comprehensive new information and communication network for mobile and stationary PMR users.

Implementing an update to a backhaul network often requires months of planning and project development regarding network capacities, reliability, and other technical aspects



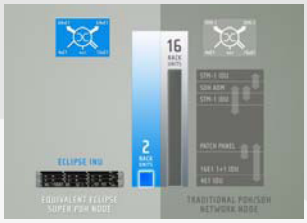
Map showing a part of nation-wide locations of Eclipse radio installations, including the S-PDH ring



Super-PDH™

Eclipse is the only platform on the market to support Super-PDH capacity migration, enabling link speeds to be configured by software from 4xE1 up to 75xE1.

Modulation options are available to enable links to be optimized for channel bandwidth or system performance.



Eclipse Nodes

Each Eclipse indoor unit has a complete network solution built into every node. This innovative design removes the need to co-locate external switches, multiplexers, and patch panels. The result is that the same 16 rack units that are needed to accommodate traditional PDH/SDH network node can be reduced to only 2 rack units with an Eclipse Super-PDH node.

Guaranteed Licensed Band Operation

Licensed frequency band options from 5 to 38 GHz, provide interference-free operation and dedicated capacity for data traffic, over extended path distances up to 50 miles.

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of communication system design. But with Eclipse, its network development features make planning simple, because the Eclipse system is inherently future-proof. It was installed quickly and remains flexible for future modifications of the technical solution and/or the network configuration.

Reliability and Control

The microwave backhaul network consists of several sub-networks linked into an integrated telecommunications network. Every sub-network is configured in a protected Super-PDH ring to provide protected connections for the TETRA base stations.

The TETRA and Eclipse backhaul networks are monitored in real time, from a control/monitoring center operated by MUP. The networks are monitored using HSTX's Element Management System, ProVision. ProVision provides comprehensive performance monitoring and control of the backhaul network. It enables total management of all technical parameters related to every node and terminal in the backhaul network.

A Future-proof Solution

Eclipse provides freedom of choice and flexibility for adjusting to customers' dynamic needs. Using Eclipse, customers can easily modify network configurations, enable network changes, or extend the network with new microwave links.

The Eclipse microwave platform enables structured planning of network expansions, capacity upgrades, and reconfiguration of the network. If the need arises, investors can upgrade the capacity of individual links by installing appropriate software licenses and unlocking one of the higher transfer capacity options.

Microwave radio towers in Croatia

A Networking Achievement

Through installing an Eclipse backhaul network to connect TETRA base stations, MUP and ZET have gained the advantages of a fully protected digital microwave network. The results are superior flexibility, robustness, and security.

Compared to conventional point-to-point microwave links, the Eclipse network has been implemented at a significantly lower cost. By using the nodal Eclipse platform in ring configuration and its built-in S-PDH capability, the quantity of microwave equipment required, and the associated installation costs, are reduced by almost half in comparison to conventional point-to-point microwave links. With the Eclipse S-PDH backhaul, MUP and ZET are assured of a secure, high-quality voice and data communication, totally independent from commercial operators, and technologically ready for additional services and projects.