LUKA KOPER
Port of Koper

> With just a few clicks, we now get an overview of the entire network. This has simplified and optimised the processes – something that is crucial in our scope of work.

Edvin Raubar
Freelance Professional, the Electronics Department

CASE STUDY

With its technologically advanced communications network, Port Koper keeps pace with its competitive ports.

Foto: Aleš Rosa

SMART COM

Extreme networks
Technology partner

Luka Koper d.d. *is a modern, multifunctional port, operating as one of the most important and state-of-the-art ports in the northern Adriatic. It provides customers with the port and logistics-related services by being involved in international commodity exchanges and global business operations. To remain competitive, the port sets ambitious goals and constantly invests in its movable and immovable infrastructure.*

This combination allows the Port to grow year by year.

It is impossible to remain competitive and flexible for our customers without an adequate support provided for the entire information system that plays an important role in the operation of every modern company.

However, a reliable communication system is required for a seamless operation of the information system.

The communication system development follows the development and requirements of Port Koper's information system. This is how the Port ensures high reliability, availability, robustness, permeability, and responsiveness of its information system.

The security aspect and ability to provide an overview of events are also becoming increasingly important both on the network and application level, as Luka Koper d.d. is listed as key infrastructure of national importance.

Based on the requirements of the Port's professionals, the implementation of advanced LAN network solutions, including for the backbone and accessible network levels, firewalls and a surveillance system, was carried out by Smart Com, a communication system integration company the Port Koper has been working with for many years.

The challenge

To build a modern communications network that supports business growth amidst the convergence of various telecommunications services and the need to ensure greater cybersecurity.

The solution

The advanced LAN network will be based on the next-generation network switches provided by the leading technology provider Extreme Networks, which allow scalability and upgradeability, with double critical building blocks in the network, implemented advanced protocols, and the Extreme Mangement Center (XMC).

The effects

- The ability to connect devices, including the industrial ones (controllers and other various dedicated devices), through different media
- Fast convergence times (<50 ms) enabled by advanced network service protocols (business applications, IP telephony, video surveillance, industrial controllers, SCADA systems, etc.)
- An increased cybersecurity, as the equipment allows the configuration of basic security mechanisms and protection even at the user level
- Insight into developments on the network all the way to the application level and a faster detection of reasons for poor application performance
- Shorter response times in case of detected anomalies

Digital transformation transforms the network into a facility with an increasingly central role in the maintenance of fast-paced modern business operations

The Port Koper's network is separated into the operating and process segment (i.e. the industrial segment), which overlap in certain aspects in terms of information flow.

The traffic between the two parts is partly limited and controlled by firewalls. For technical and security reasons, each subdivision is further divided into subnets, yielding to around 150 and 200 in total.

From the initial installation onwards, the communication systems are the responsibility of the electronics department, which takes care of the system's development in accordance with the requirements of the information system and business processes. This is how the Port provides the system's high reliability, availability and responsiveness. The area covers the OSI levels from L1 to L3, i.e. from the physical connections layout (fibre optic cables and structured cabling) to the assembly, configuration, administration and maintenance of all building blocks of the communication system.

The Electronics Department manages a diverse set of tasks such as investments in technological systems like video surveillance system, SCADA systems, communication systems, etc. Furthermore, they work with other teams in purchasing heavy machinery, and they design communication systems while also maintaining the above-mentioned facilities.

The development of communication systems in Port Koper follows trends and provides support for modern business operations, while successfully tackling many challenges.

With the convergence of different types of communication services (the requirement of data, voice and video being transmitted on the same infrastructure; a modern video surveillance also runs through the network switches or LAN network) an emphasis has been put on its reliability, availability, permeability and responsiveness.

> Communication can quickly be lost because certain types of devices are sensitive to certain types and volumes of traffic flow.
>
> This is why, among other things, we decided to segment the network.

The demanding environmental conditions, such as exposure to dust, rain, cold and high temperatures, are an important factor in the selection of equipment, as the latter must function perfectly in any conditions.

The equipment connected to the LAN network is also particularly challenging. It includes the most modern server systems, video surveillance system, workstations, access points to various control, SCADA and other process systems, which do not have enormous capacities and are extremely sensitive to certain types of traffic flows.

In recent years, cyber security has taken on an important role, although the department always makes sure the CIS is secure.

Foto: Aleš Rosa

An altered approach towards the network management for improved customer flexibility, competitive advantage and performance.

For the rationalisation of costs and volume of work, the renovation of the Port Koper network was carried out in stages. The gradual introduction of innovations, i.e. systems and technologies, brings a number of advantages. Such large-scale projects take time; there is a need to study the challenges, come up with the most appropriate solution, carry out the implementation, and of course to educate and gain hands-on experience. This way, the Port provides maximum control over the systems.

They decided to upgrade the network because the support for the existing equipment was expiring and spare parts were no longer available. The backbone of the communications network was thus utilised to implement the up-to-date equipment – the next generation switches by the Extreme Networks technology provider that respond to their challenges and requirements.

> We have been working with the Smart Com team for many years. Their staff is highly skilled, always available and ready to help, and they follow the latest trends in the field of communication systems.
>
> Each year, they present innovations in the development of communication systems that address contemporary challenges – something Port Koper is certainly not in shortage of.

Today, the communication system in Port Koper consists of more than 500 components, i.e. network switches, wireless access points, firewalls, etc., and more than 3,000 different devices (controllers, workstations, servers) are connected to the local network.

The backbone of the communication system comprises a stack of high-performance Extreme Networks network switches, which are interconnected in a ring network by means of single-layer optical fibre, delivering data transfer rates of up to 10 Gbit/s. Funds are scattered at various locations within the Port.

This ensures redundancy in the event of damage to any of the communication lines. The access network switches are connected to the backbone via a 1 Gbit/s connection.

Main technical features of the Extreme Networks integrated switches

- ✓ They provide high permeability on all connectors and connections between switches (Non-Blocking Hardware Technology).
- ✓ They provide the Ethernet power supply on user ports via the standard 802.3af(PoE)/802.3at(PoE+) protocols.
- ✓ The redundant components of building blocks allow a high availability of every device (double power supplies, stack architecture, etc.) and, as a result, of the entire network.
- ✓ The switches allow different architectures in linking the switches in the network, i.e. bonding, M-LAG (Multi-Chassis Link Aggregation), and stacking. The architectures allow for short convergence switching times and automatic switching in the event of failure or non-functioning of individual components.

Benefits for Port Koper

- ✓ The Extreme Networks switches use the ExtremeXOS operating system that allows high availability, a number of functionalities and an efficient management.
- ✓ The operating system with built-in security features on the switch also allows the following:
  - the introduction of network access control (NAC) in the integration with an authentication server (RADIUS, AD),
  - the prevention of DoS (Denial of Service) attacks,
  - the check-up and disablement of unchecked DHCP servers and more.

Control, simple management and automation in modern networks

The renewed LAN as implemented by the Smart Com company, which was selected in a public tender, provides the Port Koper with adequate throughputs for data traffic, user connection and devices through a variety of media – the universal structured wiring and optics (single-mode and multi-fibre). The implemented security mechanisms limit the incorrect or malicious connection of devices and/or running of system services or even prevent downtime in networks.

> It is true that maintenance and deployment of preventative measures are relatively expensive, but in the event of an incident (communication system/device malfunction), the mitigation of consequences comes at an even greater cost.
>
> It is up to every company to decide what matters to them and what are they going to spend their funds on. In case of an incident on our side, the entire Port Koper's operation would come to a halt, which is why prevention is crucial for us.

Problems are easier and faster to detect within a network, which is a major dilemma when designing and installing the system. What is the cause? Is the problem in the network, or maybe in applications? Modern Extreme Networks switches make this easier.

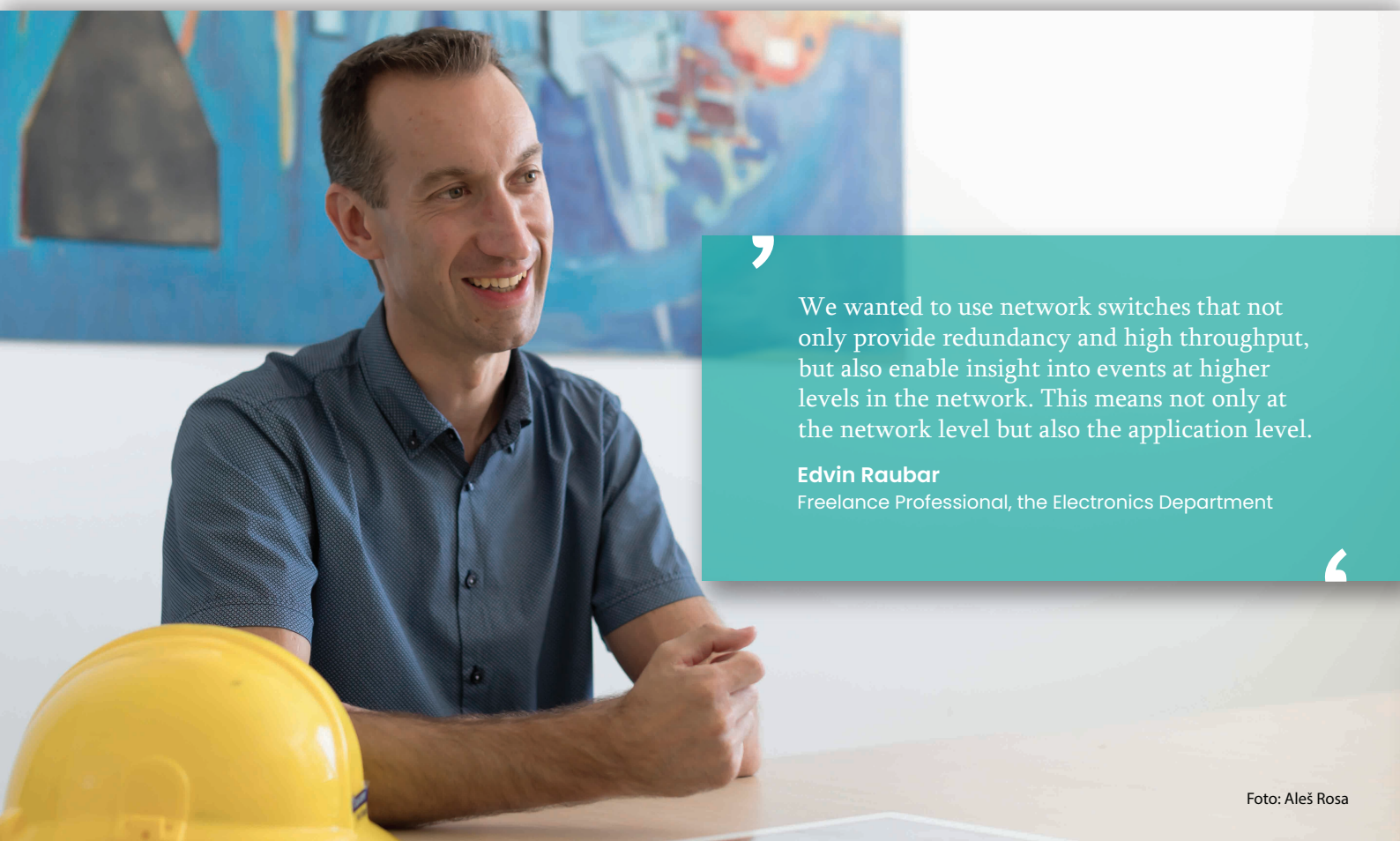
An external service provider is responsible for detecting application-level problems, and the communication section must be handled by the electronics department team. Extreme Networks software allows quick informing and action in case of problems or anomalies. Together with the last phase of backbone network reconstruction, the Port implemented the basic version of the XMC Management Center (Extreme Management Center). With the integrated analytical tool, they centrally manage and control building blocks within the network. All devices that enable the SNMP protocol are supported. This provides:

- ✓ graphical control over the network building blocks (switches, etc.),
- ✓ switch management (configuration),
- ✓ automatic storage and configuration management for all devices in the network.

The XMC Control Center provides control over access to LAN network in connection with the Extreme Networks built-in network switches. The user signs in, verifies, and establishes connection in case they have the adequate rights. The SCADA system managers, who also have access to the network, may inadvertently bring malicious code or virus into the system. The system detects such an anomaly and alerts the administrator about it.

Take full advantage of the benefits of digitalization

In developing comprehensive solutions for modern business and industrial networks, Extreme Networks and Smart Com take into consideration the key challenges users are faced with, as well as trends affecting the network development.



> We wanted to use network switches that not only provide redundancy and high throughput, but also enable insight into events at higher levels in the network. This means not only at the network level but also the application level.
>
> **Edvin Raubar**
> Freelance Professional, the Electronics Department

Foto: Aleš Rosa

LUKA KOPER
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We tackle the following modern key challenges in the industrial and business networks: Automated machine-learning based management, enforcement of network policies, network anomaly detection and elimination, lack of network agility and scalability, growth in the number of users and devices within the network, the complexity of new applications, lack of a deep insight into applications.

If you are facing these or similar challenges, we would be happy to help you with the choice and implementation of a technology solution that is user-friendly, functionally sophisticated and affordable. Besides consulting service and the solution implementation, we can provide system maintenance and technical support.

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