# eurofunk

# news

## RESEARCH, INNOVATION, COLLABORATION AND SECURITY

Learn more about the flexibility of this interplay

**BUSINESS INTELLIGENCE**

Your overview for analysis and as Dashboard

**COMPANY OF THE YEAR**

1st place for eurofunk

**GEODATA UNDER CONTROL**

GeoAppliance as a possible solution

# eurofunk has a New Look

### Dear Readers,

We are delighted to present the latest edition of eurofunk News. It is now decades since we began publishing our newsletter for customers and partners on a regular basis; in every issue, we try to bring you a mix of subjects that is as interesting as possible. This time we have also included the latest market news, information on product portfolio innovations, technology developments and trends.

Innovation and the knowledge of how to create security are our biggest motivators, which is why we have been developing control center solutions for more than 30 years. At the beginning of 2017, we opened our new research and innovation center in St. Johann im Pongau (p. 8) where we now have more than 500 employees. They contribute through their knowledge in a variety of ways to the safety of millions of people.

Although our products are constantly evolving and we always try to keep up with the latest developments, our visual appearance was unable to keep up pace of this development. In a project lasting almost a year, we have completely reworked eurofunk's corporate design and now present ourselves in a modern, fresh corporate design. This means that we now also visually meet the requirements of a highly-innovative company. So if you come across the new logo below, we can reassure you: This is not a plagiarism but a fresh, "original" design. ☺

**"Innovation and the knowledge to create security is our biggest motivator."**

We look forward to your feedback and hope you enjoy reading about the exciting news items in this year's eurofunk NEWS

Christian KAPPACHER – CEO

# Contents

# eurofunk:
# Company of the Year '17!



Dejan VUKOVIC

Every year, the Salzburg Chamber of Commerce honours the most outstanding achievements of the year. As the **first company to be nominated in two categories at the same time,** we were understandably very excited as we took part in the award ceremony on April 27, 2017.

Out of a total of **80 submissions** in the **category "Company of the Year"** we were able to compete successfully and duly received the coveted trophy for first place. In order to substantiate the high quality and innovative spirit of our employees, we were awarded **third place** in the category **"Innovation"** for our **eOCS product.**

We are very proud of the successes achieved by our eurofunk team in recent years which has culminated in this outstanding performance.

We would also like to take this opportunity to thank all our customers. Their cooperation and loyal partnership has made a



significant contribution to the positive development and innovation behind our products!

The video of the gala event, as well as the nomination videos from **eurofunk,** can be found on YouTube using the search word "Salzburger Wirtschaftspreis 2017".

# eNNOV8:
# Innovation and Collaboration

**Every innovative technology company deals with a multitude of questions at all times. Where is the market heading? Which trends can generate added value for our customers? How can new technologies support novel solutions for a greater customer benefit?**

If one asks oneself these questions, many other questions arise in this context, e.g.: How can my company, from both an organisational and process point of view, position itself to ensure that innovation and tackling future issues are an integral part of product and solution development? What "bright minds" do I have and need? How do I create a positive and creative environment in which the open exchange of ideas and the symbiosis of different competences is promoted? How should a working environment be designed spatially in order to be open and flexible, while at the same time allowing the creation of holistic, innovative and high-quality mission-critical solutions?

A large number of changes and further development within the company as well as the processes in research and development are constantly necessary in order to maintain a technological lead. In this way, for example, Agile product development supports creativity, innovation, end-to-end quality and collaboration with the "Power of small teams" (see p. 16). In order to create the optimal environment for the teams for the most diverse challenges and team structures, a completely new innovation center has been jointly created at eurofunk's headquarters in St. Johann in Pongau over the past few months. Under the name eNNOV8 [e:nnovaet], derived from the address eurofunk-Straße 8 and the motivation behind the building "innovate!", all the

skillsets from research, product design, development and product quality assurance were brought together under one roof. Based on scientific evidence, an open office concept was developed in joint cooperation with experienced interior design specialists and our own employees. This offers the most suitable solution for all work situations. For instance, there are versatile and uniquely equipped, height-adjustable workstations that allow flexible changes to teams or the temporary use of workstations at any time. In addition, there is a wide variety of "ME" and "WE" zones: On the one hand, there are relaxation points such as couches, isolated individual armchairs, loungers or a beach shelter, where you can retreat for focused individual work or longer telephone calls. On the other hand, there are numerous creative meeting rooms (WE zones), dedicated to past pioneers and innovators. The core of the WE zones is a large open cafeteria with a wide variety of seating options and standing facilities which serves as the central hub for cappuccinos and café lattes, supporting incidental and spontaneous networking.

Furthermore, a workout zone (= fitness area) was created in the building to "free up your mind", where different group fitness programs (pump, step, spinning, yoga, summer-fit, etc.) take place and promote the collective enjoyment of movement. An individual "sweat session" on the treadmill

or indoor bike is also possible. If that's not enough action, the playground can be used to play table football, air hockey, darts, table tennis or game consoles with colleagues. The playground is also a popular meeting place for an after-work drink.

eurofunk's individually designed, google-like office was planned down to the smallest detail by an interior design team
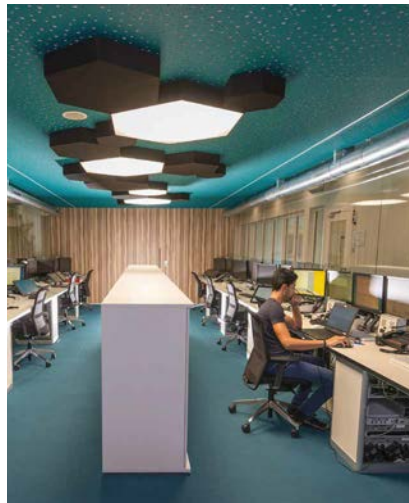
comprising several creative employees and management. On behalf of the company management and all "knowledge-workers", we would like to express our sincere gratitude to this team!

Anyone who knows eurofunk knows that we don't do things by half. We are currently in the process of redesigning our existing premises at this location in line with the

eNNOV8 concept. In recent weeks, numerous construction measures have taken place in order to bring the people who work together (process oriented) closer together in all areas of the company and, again, to create common communication zones.

We would be happy to personally show you around our completely redesigned eurofunk headquarters from 2018 onwards!

Christian KAPPACHER

# eurofunk Service "reloaded"

## … personal, fast and reliable

**A high level of customer satisfaction has long been very important at eurofunk. An objective that has also been incorporated in the company's goals.**

A decisive factor influencing the achievement of this goal is support during the service phase. For this reason, the eurofunk service process was defined last year as one of the three core processes in eurofunk process management and the organisational structure was realigned accordingly – the eurofunk Service as a separate business unit was launched.

The restructured eurofunk Service Team, led by Markus Schafflinger, started its work on 1 November 2016.

## WHAT HAS HAPPENED SO FAR?

The service organisation and the management team were restructured. The Service division now includes the departments Customer Care Center, Technical Support, Software Support, Field Service, Customer Consulting and Command & Control Solutions.

● **Customer Care Center**
The Service Desk, as "single point of contact" for our customers, Maintenance Contract Management and our Customer Service Manager are all located in the Customer Care Center under the direction of Joe Windinger.

● **Technical Support**
The "Technical Support" department, formerly known as the „Hotline", was divided into two teams, 1st and 2nd level support. This means that the IT Infrastructure Library (ITIL) procedure model will continue to be implemented consistently. Christoph Weiß heads the "1st level support" team and Christian Steinbauer heads the "2nd level support" team. Markus Weissl is responsible for the entire department.

● **Software Support**
The Software Support department headed by André Kruse is responsible for "3rd level support". This is made up of developers and testers and the provision of patches for eurofunk products.

● **Field Service**
Field Service under the leadership of Charly D' Ambros represents the on-site service. This department is responsible for rectifying faults and preventive maintenance on customer systems.

● **Customer Consulting**
"Customer Consulting", headed by Matthias Doppelmayer, focuses on supporting and advising our existing customers.

"Our satisfied customers and the continuous optimisation of our service is what motivates us and drives us forward!"

Markus SCHAFFLINGER





- **Command & Control Solutions**
  The „Command & Control Solutions" team plans, installs and configures operation control system solutions for our new customers. The team, headed by Andreas Deutinger, attaches particular importance to requirements analyses according to the IREB (international requirements engineering board) model.

In addition to restructuring the departments, we have also optimised internal **processes for ticket processing.** Previously, tickets were always forwarded from the service organisation to the specialist departments; but now they remain the responsibility of the Service department. If a technical support request is received, technical support remains the contact for the respective ticket. The team leaders in 1st and 2nd level support

adhere to contractually agreed times and the correct allocation of tickets.

**"Direct communication as a path to success"** is our motto for making ticket processing transparent and efficient. Instead of lengthy written communication, telephone calls are increasingly being used to clarify the situation, and only the result is recorded in the ticket and shared with the customer.

The helpLine ticket system we are using has been updated to the latest version 6.3. The new version allows customers to inspect problem tickets. In addition, new evaluation reports and a completely new web interface are also available.

## WHAT'S THE NEXT STEP?

Of course, time does not stand still and the Service will continue to evolve. We are currently working on the following areas in order to offer you an even better service in the future:

- **Event Monitoring** as a central service to detect incidents on customer systems at an early stage and to initiate preventive measures before a disruption of the control center operation can occur.

  > **Have we awakened your curiosity?**
  > **For more on this, see page 24**

- Professional **Change Management** is essential when dealing with a critical infrastructure. Cost-benefit analysis, risk assessment, contingency plans and factual decision-making which is documented, have become mandatory, when making significant changes to live systems.

- In the future, the **Change Management Process** will be managed by our Change Manager, Robert Stöckl, and developed further, in order to handle changes to the systems even better.

These and many other steps are constantly being implemented in order to optimise our service and continuously adapt it to the requirements of the market and your control centers

# eurofunk Researches for You!

**If you look up the word "research" in the Duden dictionary, you can find synonyms such as determined, hands-on, fearless and goal-oriented.**

Similarly, in Salzburg's Pongau region, we also have the idiomatic expression "da brauchst schon an Foschtl", which means something like: "you need a certain amount of practice and courage to do things well".

We at eurofunk conduct research precisely in accordance with the above-mentioned aspects. In other words, it is all about driving forward ideas, concepts and visions from the mere paper level, to a feasibility study level, the development of prototypes and finally market readiness with the corresponding courage to take risks and resolutely implement the goals. Almost 50 years of company history and the resultant innovations and product successes demonstrate that we have the necessary "Foschtl".

For many years, we have been conducting research soley within our own four walls and without the involvement of external experts, simply to keep our ideas secret. In the meantime, however, trends such as open innovation, open source and open data have also caught on in the security-critical systems market. In addition, the many years of cooperation and partnerships with universities, universities of applied sciences and external experts, such as designers or sound engineers, have resulted in many synergies as well as great products for our customers.

One of our current research projects, which we have named 4C4FirstResponder, aims to develop a communication and information solution to optimize the deployment of intervention forces. To this end, multisensorial data (text, audio, images, video, etc.) are generated, combined to form a situation picture and distributed on a role basis (e.g. to mobile teams or the operations management). The core of the communication solution is communication manager software in which TETRA and other network technologies (UMTS/LTE and WiFi) are integrated, so that the advantages of all technologies can be utilized and data is distributed in accordance with the QoS requirements (Quality of Service) across the different technologies. This makes possible a scenario-oriented and time-optimised coordination of first responders and emergency teams (police, fire brigade,

Christian REPASKI

rescue etc.). An important component of the solution is a scenario-oriented representation of data and operations on (mobile) devices. The project follows an agile development approach and started with an assessment of the needs of the emergency services.

Mobile security services are integrated as "human sensors" in order to enable a more efficient interaction between the operations center and the mobile teams. The provision of sensors and video cameras worn on the body as well as mobile displays ("handheld" or "helmet-mounted") are basic prerequisites. Mobile teams are therefore both sensors and operators at the same time, thus making enhanced data acquisition and networked incident management possible.

4C4FirstResponder is a joint venture between eurofunk, Joanneum Research Graz, Lakeside Labs, Dräger Austria, IFR, FFW Gumpoldskirchen, Karl-Franzens-University Graz (Institute for Sociology) and the Federal Ministry of the Interior.

We at eurofunk always conduct research with the aim of offering our customers added value. In this way, we can support you even better and more efficiently in your tasks and activities through our products. Not all of our ideas make it to the market or prove to be feasible. But research is not always successful and knowing how far and to what extent an idea does not work is just as valuable as a working prototype. All this knowledge is integrated into our latest products and means added value for you.
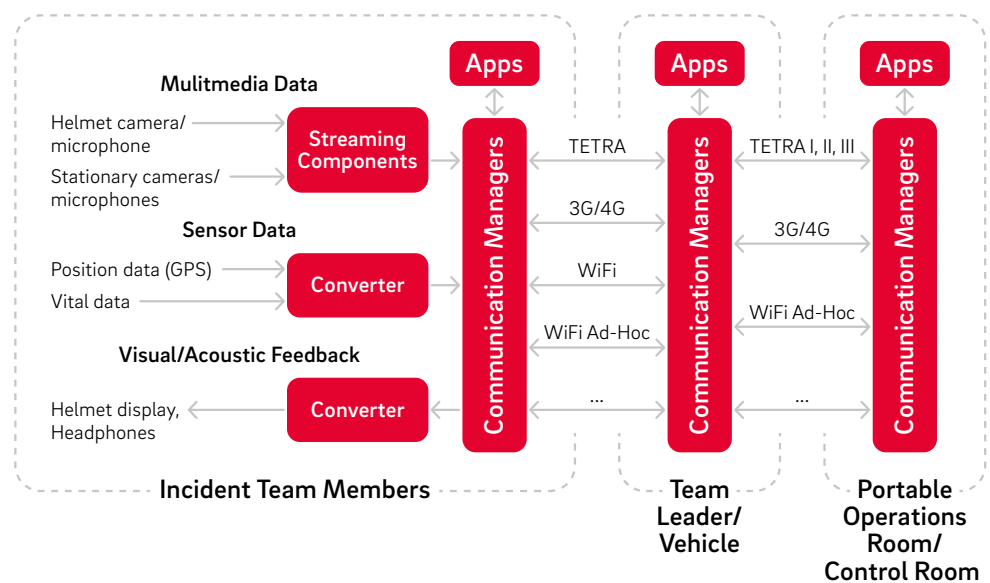


**Fig. 1:** Embedding the communication manager in the various hierarchy levels.

# Agile Methods
# at eurofunk

Agile methods have long since outgrown
start-ups and Silicon Valley and have reached
companies with hundreds or even thousands
of employees. From financial markets to
e-commerce, agile methods are gaining
ground worldwide. They reduce complexity
and maximise customer benefit.
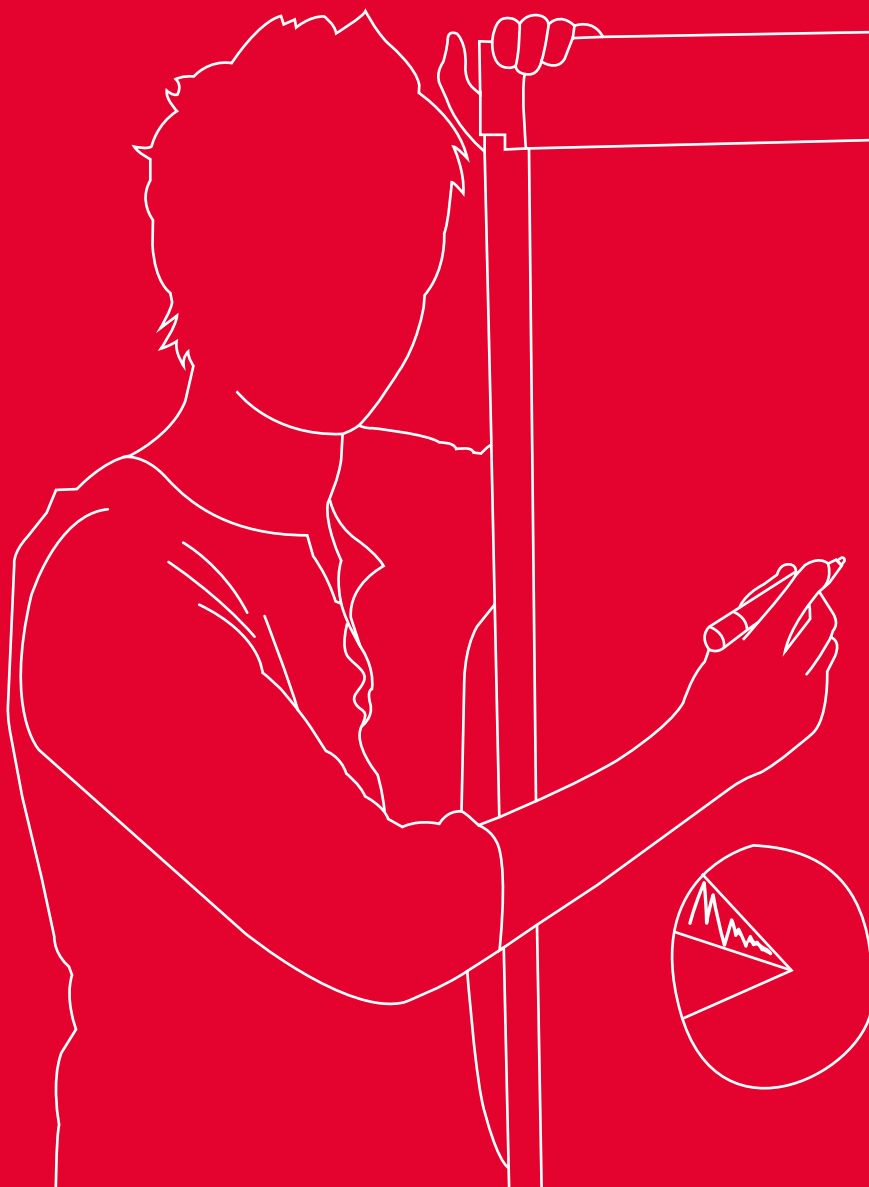
Tobias KAZMIERCZAK

For more than 15 years, the popularity of agile methods has been increasing and replacing the classic software development process (e.g. V Model). But just what is agile software development? Agile is derived from the Latin word "agilis" and means nimble or flexible and expresses the ability to react to changing conditions and knowledge. This is achieved by the so-called iterative approach, in which process steps are repeated periodically to achieve the desired result step by step.

## WHY DID THIS CHANGE IN PROCEDURE OCCUR?

Systems and requirements are becoming increasingly complex – making it almost impossible to complete the specification phase in such a way that subsequent implementation can be carried out exactly according to plan. In addition, **technologies and frameworks are so fast-paced and versatile** that an early definition often leads to high implementation costs.

The agile answer to this change is: **an iterative approach in teams which self-organize** and where there is little bureaucratic burden. For everyone concerned, the focus is no longer on stubborn work according to plan but **the high and evident benefits for the customer.** Feedback loops ensure that the goal is achieved and that the focus is not lost in the detail.

But how can it work without ending up in an unorganised chaos? Already on the first page of the Scrum Guide (Practical instructions for the agile Scrum methodology), it is stated that the lightweight rules are easy to understand, but difficult to implement. The **most important factor for success** is that everyone involved understands the agile basic principles and implements them consistently – both on the part of the client and the contractor.

Important principles become clearer through the **magic triangle** of time, functionality and quality. Traditional software development assumes that time and functionality are fixed within the framework of detailed specifications and project plans. Unfortunately, this often means that the third factor, "quality", suffers. This leads to unexpected time delays and problematic errors in functionality. The result is a loss on both sides. This is not so in

agile software development where time and quality are fixed. Defined time periods, called iterations, give the team space to deliver presentable results – with a defined quality, which is specified in **the "Definition of done".** It is crucial that results, even if small, add value. Usage scenarios are predefined, which are then supported technically in a focused way within a defined time period. If a fixed time and quality are guaranteed, the functional scope is there to act as an fine-tuning mechanism to ensure success. This means letting go of unnecessary functionality and reducing it to what brings the client the most value.

As a result, the initial analysis phase with our customers can be significantly shorter and a working solution can be available early on in the project. By prioritising the so-called backlogs, features are then ranked according to their importance for processing by software development. At first glance, this agile project implementation poses challenges, especially when it comes to the procurement procedure. Certainly, there is already real scope for using agile techniques in procedures and practices to implement projects. →

# Agile Methods
# at eurofunk

Specifications within the framework of usage scenarios and "use cases" allow for a description that is largely independent of the solution. **In addition, agile methodology can be defined as a procedural model.** The principle of equality also allows for the scheduling of reviews. The assignment can then be carried out on the basis of a functional service description, the level of detail can then be consciously shifted to the development phase. Changing priorities and filling in details are thus an integral part of the project process. The client benefits from the elimination of costly change requests if there are changes in the course of the project due to technical or legal factors. The possibility of incorporating new technologies and practical findings directly into the solution opens up the opportunity of achieving maximum customer benefit at a fixed budget. The decisive factor is an active, continuous client participation in the iterative approach within a framework of continuous fine-tuning.

## HOW CAN USEFUL RESULTS BE ACHIEVED IN THE CONTEXT OF MISSION-CRITICAL CONTROL CENTER SYSTEMS WITH REAL-TIME AUDIO PROCESSING AND MULTIPLE EXTERNAL INTERFACES?

At the heart of agile methods is a self-organising, cross-functional team of seven (± 2) people who have the ability to solve complex tasks in a team. This includes requirements engineering, process and test competences and knowledge of the technologies used. This gives a team the ability to manage tasks from inception to successful testing – with minimal overheads and free of heavyweight processes. This focus on end-to-end functionality helps us to quickly create and maintain customer value.

However, significantly more people than just one agile team are involved in the development of a product. This is precisely why there are "best practice" frameworks such as LESS or SAFe (Scaled Agile Framework). They show how this way of working can be implemented successfully in larger and thus scaled environments. At eurofunk, we have successfully implemented the Scaled Agile Framework. It gives us the opportunity to prioritise our product development initiatives transparently and to

implement even complex tasks in a few iterations by teams with their own product owners.

In so-called Program Increments (PI) Plannings, our agile teams plan what they intend to do for the next four iterations (8 weeks). The "Program Team", which sets the framework conditions for prioritised functionalities, provides the orientation for the implementation of important topics.

**The four core values of SAFe, which we too have embraced:**

- Transparency,
- Alignment,
- Execution and
- Quality.

The teams are supported by Scrum Masters and a Release Train Engineer. This is to ensure that transparency and a focus on priorities are maintained during the PI and that successful implementation with defined quality is ensured. Long-term technical objectives are defined and implemented as part of an "Architectural Runway". The core values are upheld and performance is constantly improved through continuous improvements with the help of retrospectives, both in the individual teams and in all the teams as a whole.

Based on the eOCS product, which covers the functionality of communication technology as well as control center and management systems, the product is enhanced incrementally to meet current market requirements. The product grows in large steps in close cooperation with our customers. A new release occurs five times a year, creating added value. In this way, we create the right technology to support the emergency services – or in short – **creating safety by technology!**

**PRODUCTS | SOLUTIONS | SERVICE**

# EU General Data Protection Regulation: Are You Ready?

May 25, 2018 is a red letter day: The new EU General Data Protection Regulation (short EU GDPR) comes into force. The Regulation provides a revolutionary framework for the protection of personal data and serves to protect the personal data of European citizens worldwide. This Regulation applies to any company which controls or processes the personal data of an EU citizen, regardless of the geographical location of the company.    →

# EU General Data Protection Regulation: Are You Ready?

**"Although the Regulation has been designed primarily for 'big' data collectors, it applies to all companies processing personal data."**

Although the Regulation has been designed primarily for 'big' data collectors, it applies to all companies and organisations processing personal data. Particular attention should be paid to the Regulation **with regard to future penalties for data protection violations,** since **penalties of up to EUR 20 million** or up to four percent of the total annual turnover achieved worldwide can be imposed.

In order to understand the consequences of the new provisions for better protection of personal data for a company, it is first necessary to analyse precisely which personal data are available and why they are being processed. **Risk assessment is an essential part of data protection.** Questions such as, e.g., "How are these data changed?", "How long are they used?", or "Where are the data stored and how well are they protected?" must therefore be answered.

Many of the cornerstones of **EU GDPR** are not new and can also be found in current national legislation. This also applies to the right "to be forgotten", which is derived from the General Data Protection Regulation, in particular for data deletion. This means that the **obligation to delete personal data** arises, for example, when the purpose of storage no longer applies. It is important to mention here that s**tatutory storage obligations cannot be circumvented** or in other words, must continue to be observed and there may be exceptions to the deletion obligation, such as a public interest or criminal law issues.

The EU GDPR also significantly expands the scope of the right to information. A concerned person may request confirmation from those responsible as to whether or not the company processes personal data relating to him/her and, if so, which data exactly. Failure to provide this information or failure to supply it in full **will result in high fines according to EU GDPR.** For this reason, it is advisable to take organisational precautions in good time in order to be able to provide correct information in a timely manner.

As EU GDPR imposes more responsibility and far-reaching obligations on companies, eurofunk is also amending the agreement on contract data processing. If you have not yet received a (data protection regulation) supplementary agreement to the existing maintenance contract, eurofunk will contact you within the next few months regarding the necessary amendments. **These will be carried out by May 2018.**

We take the current developments as an occasion to strengthen consumer confidence and that of our customers and partners by means of recognised competences as well as an **organisation of personal data that is fully aligned with the EU GDPR.** This includes, among others, the **integration of the data protection management system** into our existing **ISO 9001 certified quality management system (QMS)** and our **ISO 27001 certified information security management system (ISMS).** These synergies form the basis for the protection of personal data and the privacy of our partners and customers.

Even if the security control centers are not the focus of the EU GDPR, „directories of processing activities" must still be maintained here. This means that all the categories of data processed, the classification of affected individuals, the intended data transfers and proposed deletion periods must be documented. In addition, we must also draft a description of the general technical and organisational measures for data security.

This also means that the systems used in the control centers should provide optimal support for the new requirements. For instance, we must ensure principles such as **'privacy by design'** and **'privacy by default' are applied.** Optimising the default settings to meet data protection law should ensure the best possible personal data protection. **It is the responsible data protection supervisor who decides the measures that are necessary and also proportionate in each case.** This also shows that differences in legislation are not the only reasons for differing implementations of the EU GDPR in different organisations or control centers.

❯ **If you, our customer, should identify any changes which are necessary to your system as a result of the new EU GDPR, please do not hesitate to contact us. We will be happy to examine the technical capabilities of your system in order to minimize the burden of regulatory compliance.**

Martin JÖRG                    Stefan MAIER

# Outlook: The Road from TETRA to LTE for Public Safety Organisations

TETRA is growing and is the dominant force in the transmission of mission-critical communications and short messages (SDS) for public safety organisations. However, demand for broadband communications is still rapidly increasing.

Countries like Germany, Austria and Norway have either just completed or are rolling out new TETRA systems. The Netherlands is currently building a new TETRA system, replacing an existing one. Finland, Sweden, Belgium and Hungary are upgrading their TETRA systems, while also investing in broadband technology.

Yet some are also now moving forward with a pure LTE solution for mission-critical voice and data transmission, thus linking radio operation with mobile telephony. The FirstNet project in the US and ESN in Great Britain are set to become trendsetters.

### What is mission-critical communication?

Mission-critical communication means that failure or malfunction of a critical service or other critical resource would jeopardise the mission, typically involving serious financial losses or even loss of human life. Mission-critical communication means that the communication itself is classified as mission-critical. In a worst-case scenario, collapse of the communication structure would incapacitate the organisation.

## THE STATUS QUO

Public LTE networks do not meet public safety requirements for mission-critical communications. For instance, LTE networks do not offer any group communication capabilities (multicast), guaranteed call setup time, call prioritisation or end-to-end voice encryption that are comparable to TETRA. Commercial mobile phones do not offer support comparable to TETRA for group communication, Push-To-Talk (PTT) or Direct-Mode Operation (DMO), and are generally not very suitable for 'robust' applications.

## LTE NETWORKS IN FLUX

The current situation is gradually shifting. The 3rd-Generation Partnership Project (3GPP) defines globally applicable communication standards that enable LTE network expansion to meet typical public safety requirements. In this process, 3GPP is working in partnership with the TETRA and Critical Communications Association (TCCA).

This means that in the future, LTE networks will meet requirements for mission-critical communications. The corresponding services will be available, with the required service quality and reliability, not only for voice and text, but also for images, video and broadband data transmission. What we are accustomed to in mission-critical voice communications will also apply for broadband transmission, such as realtime video.

## 3GPP ROADMAP

### 3GPP LTE Release 12 – the Foundation for Group Communication over LTE

Release 12 lays the foundation. Mission Critical Voice (MCVoice) services such as Proximity Service (ProSE) have been defined. MCVoice is the counterpart to TETRA group communication, and Proximity Service is the counterpart to TETRA DMO.

### 3GPP Release 13 – Mission-Critical PTT

Mission Critical PTT (MCPTT) is a key component of LTE Release 13. MCPTT was defined in 2016 and was first tested in 2017 in a plug test with components from various manufacturers. This makes the building blocks available for mission-critical transmissions. However, release 13 does not yet define the full scope of MCPTT.

### 3GPP Release 14

The focus of 3GPP specification work for LTE release 14 is currently on Mission Critical Video (MCVideo), Mission Critical Data (MCData) and additions to MCPTT.

### 3GPP Release 15 – Adequate Coverage with LTE standards

TCCA estimates that LTE release 15 should provide adequate coverage by standardising LTE to support mission-critical services.

In addition to the networks, this naturally also requires suitable terminal devices.

## HYBRID TERMINAL DEVICES

As mentioned briefly above, commercial mobile telephones are rarely suitable for use as the sole means of communication for emergency personnel. However, toughened LTE devices are already available that are comparable to walkie-talkies.

A particularly interesting option has recently appeared: hybrid devices that support both TETRA and LTE, which are a combination of a TETRA radio device and smartphone. In addition to reducing the number of devices that emergency personnel must carry, this also promotes a smooth migration from TETRA to LTE →

# Outlook: The Road from TETRA to LTE for Public Safety Organisations

"LTE networks will meet the requirements for mission-critical communications in the future."



## MIGRATION OPTIONS AND STEPS FROM TETRA TO LTE

Aside from the aforementioned technical expansions that we may collectively refer to as expansion of mission-critical communication services and the toughening up of the LTE networks and devices, two key factors will influence the overall solution:

1. Shared LTE network vs dedicated LTE network
2. Shared spectrum vs dedicated spectrum

'Shared' means that the resources (network or spectrum) are shared with public mobile telephony. 'Dedicated' means that the resources are used exclusively.

For the spectrum (frequency range), the 700MHz band is of particular interest in the use of LTE, compared to higher frequency bands, due to its favourable physical expansion properties.

A few countries have already reserved part of this valuable frequency range for exclusive use by public safety organisations. However, the 700MHz band is not comparable to the 400MHz TETRA band, which is particularly evident in the considerable increase in the number of base stations for comprehensive radio coverage with LTE. A dedicated LTE network is a distant prospect for most.

All eyes are on the forthcoming insights from the ESN project (introduction of LTE in Great Britain for public safety and other organisations). By choosing a shared LTE network with shared spectrum, Great Britain opted for what is certainly the option with the highest risk attached. On the other hand, it also offers the biggest cost savings. Rollout of the ESN project is planned between 2017 and 2020.

TCCA estimates that the shift from TETRA to LTE will occur in phases between 2020 and 2030. Those getting started now are still considered 'early adopters'. Those who start migrating from TETRA to LTE in 2030 will be late, if not in fact too late.

Johann DOPPLER

# Station Alert

Kurt ABSMANN

**"Let's move out: command vehicle, water tender, turntable ladder!" This is one of the announcements relayed over the new eurofunk station alert system since the commissioning of the Munich control center in July 2017 in fire stations 1 to 10.**

The new development of the Public Address (PA) gateway and the station alert service have enabled seamless integration into our communication solution, IDDS UCiP. The system was installed at the Munich conrol center with redundancy. This involves duplication of the network and multiple installs of the central components. The ELA gateways in the fire stations can be accessed by two paths. The primary path is the IP connection between the control center technology and the ELA gateway. For the secondary path, an ISDN S0 connection was set up. This failover facility enables station announcements from all control center workstations and over extension phone lines. Control for intrusion into the AF path and bell activation is handled by DTMF tones (Dual-Tone MultiFrequency).

The functional scope is not restricted, regardless of whether the IP-based connection or S0 connection is used. Munich is unique in that the PA system has an additional S0 connection that links node level two with eurofunk's emc²VoIP communication technology.

In this way, the IDDS UCiP Dispatcher allows the operator to send a manual alert over the selected alert path. This makes possible the combining of operations for the various external stations. This means then, for example, that it is possible to send the same announcement to Station 1 over the primary path and to Station 2 over the secondary path. As a result, Munich no longer needs independent individual alerts or group calls. In order to optimise speech quality and enhance intelligibility, eurofunk has integrated Wideband audio codec G.722 into the products.

Another key improvement is that a PA announcement is sent from several places simultaneously to different stations.

The incident management computer interface extends the options for automated announcement. Depending on the sequence defined, it can activate the bell, intrude into the primary path and play a text module (text-to-speech) or repeat the prerecorded announcement. In addition, a new announcement is also possible of course. This enables incident-specific, customised and more efficient alerting for the Munich Municipal Fire Brigade and, with eurofunk technology, makes it optimally equipped to deal with future incidents.



**IDDS-UCiP:**
Station alert announcement over IP or ISDN

# Event Monitoring: Taking Action for Your Business Continuity

Control centers have long been considered critical infrastructure. However, recent years have seen a shift in the concept of an control center. As a result of the rise in the number of incidents, the use of complex IT systems, increasing centralisation and complexity due to legal regulations, process support systems such as incident management system are becoming indispensable.

Markus SCHAFFLINGER

Whereas some years ago a pen, paper and telephone still provided a simple backup, fall-back solutions now pose a major challenge to many control centers, even during off-peak times. The logical consequence: ever-increasing demands on control center system availability.

As an incident management system provider, eurofunk meets this challenge and supplies suitable solutions. Project teams employ a wide range of methods to design systems for high availability – from failure-tolerant system architectures (such as duplicate networks) to redundant standby systems (such as failover to a backup control center). The fact that 100 % availability is not feasible makes it all the more vital that system monitoring and the proper service concepts are in place.

For years now, eurofunk has been supplying its control center systems with an SNMP (Simple Network Management Protocol) monitoring software solution, or connecting them to existing monitoring solutions. Both modern IT hardware and eurofunk components support SNMP, which enables system administrators at the control center to monitor individual system components and contact eurofunk Support as needed. However, system administrators are not typically available around the clock, and some also have other duties. Despite this, control center operations must still be safeguarded.

As a provider of operating center solutions, we strive for a high level of customer satisfaction by offering high quality solutions and optimal service. For this reason, we are currently working to offer our clients centralised monitoring in the near future from eurofunk Service in St. Johann im Pongau, Austria. Our service team can monitor your system components for you and respond proactively, before it has any impact on system operations.

This initiative allows us not only to stay abreast of market needs, but also to guarantee the required availability for control center systems.

↑ **Fig. 1:** The new monitoring solution
CheckMK allows for the monitoring
of load-distributed systems and display
of the distribution of accesses across
defined time periods.



← 
**Fig. 2:** Current error messages
are displayed in red. Operation
error statistics are also
available.



← 
**Fig. 3:** You can also
monitor and display
charts for bandwidth
capacity utilization
in the network.
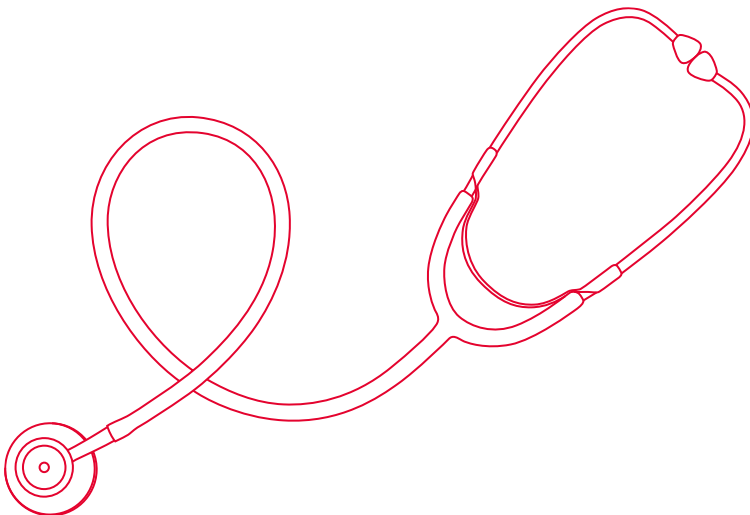
# eBI in Practice – the Importance of the Various Analysis Requirements

"… could I get an analysis ASAP of how often we had accidents involving cyclists in recent months as well as a breakdown into urban versus rural areas? Could I also get comparisons for the last three years."

System administrators or quality assurance professionals are currently fielding these kinds of requests. Two prerequisites are needed in order to fulfill these requests: the documentation and availability of the required data, and, of course, a suitable tool to analyse and provide the data in a user-friendly and intelligible form.

ELDIS, but also our new product eOCS, is used to perform everything from signal receipt, the individual steps required for acceptance and recording, dispatch, alert and incident allocation, to the supporting tasks for action completion and/or the recording of feedback and extensive automatic documentation up to incident conclusion. These data comprise the basic foundation for a wide range of analysis capabilities.

The easiest way, at first glance, would be to provide system administrators with the original data model, with its many cryptic table and field names, and grant them total freedom of analysis by providing direct access to the data. Although this method was also common until recently, it has several drawbacks. In these cases, system administrators need extensive knowledge of the data model and/or the content and syntax of the fields whose data they want to analyse. Architecture-related changes to the data model for new versions necessarily create additional work for analyses that are already available. In certain cases, directly accessing the production database using low-performing SQL queries may have an adverse impact on performance and functional reliability in the control center.

That is why eBI (eurofunk BusinessIntelligence) takes the data fields (dimensions) and measurement values (measures), in the form of DataCubes, for all manner of analyses and puts them in a format that is consistent and understandable for system administrators and/or stores them in its own data warehouse, to

Christian REPASKI

avoid overloading the product database. This entire process is carried out with the ETL (Extract, Transform, Load) tool, which is built into the eBI tool and can be used both to aggregate data and to enrich them with a wide range of additional and external source data.

Dimensions and measures must be defined for cyclical and changing requirements on regular and ad-hoc analyses. Definition of these fields requires time and effort on the part of system administrators as well as eurofunk.

Clients must consider the specific contents of analyses and their combinations, and eurofunk in turn must consider the optimal data – out of the large volume available – to be used to generate this information and improve performance.

The ideal solution would be a DataCube containing all possible dimensions and measures that can be analysed in all possible combinations. Although this is technically possible, with the corresponding outlay in effort. It would entail performance drawbacks in practice due to ever-increasing data volumes.          →
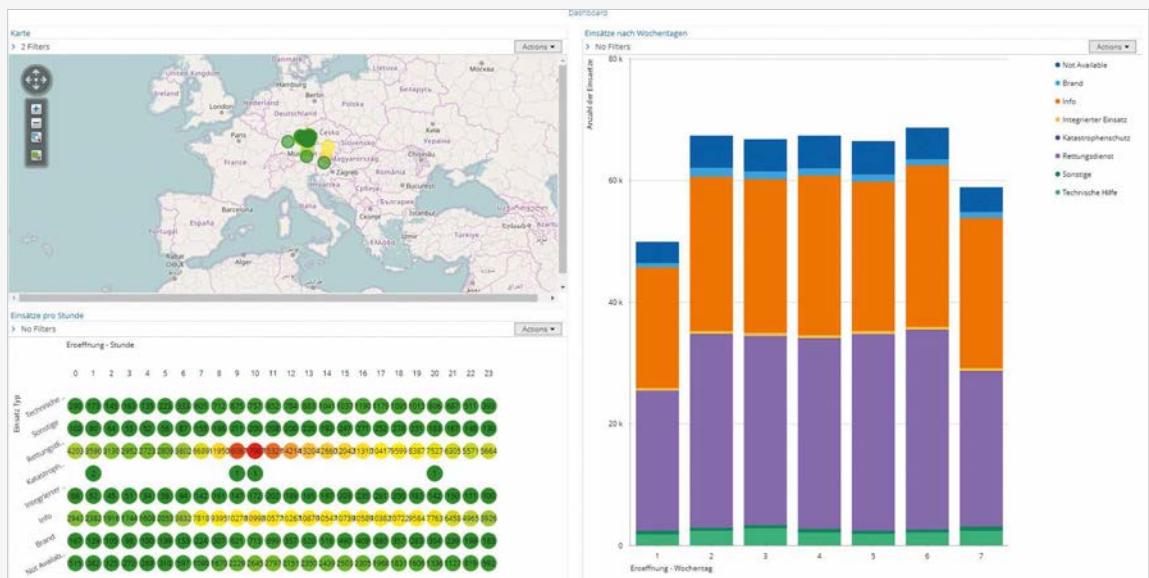


**Fig. 1:**
Dashboard

# eBI in Practice – the Importance of the Various Analysis Requirements

The eBI and its underlying DataCubes now offer system administrators new support tools:

- eBI Analyser: for extensive 2D or 3D analyses of large data volumes with numerous graphic display options

- eBI Interactive Reports: for the creation of 2D lists of specific data, needed in part for visual quality control

- eBI Dashboards: for near-realtime tracking of certain key figures, with various display options

- eBI Report Designer: for creation of 'pixel-perfect' reports, with layouts playing a major role



**Fig. 2:** Incidents per workstation.
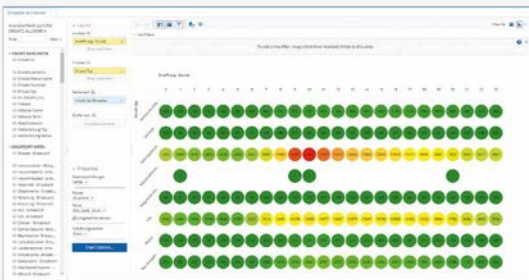


**Fig. 3:** Incidents per hour.



**Fig. 4:** Dashboard - control center capacity
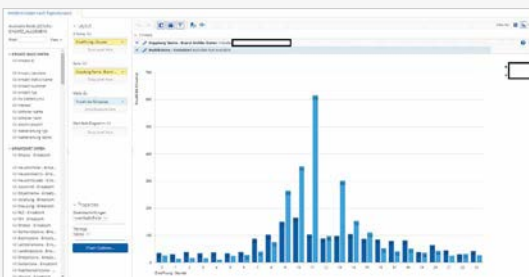


**Fig. 5:** Detector incidents by hour of the day.

The new eBI allows you to call up your analyses and reports on any workstation at any time because eBI is 100% browser-based.

Geodata in the Control Center Environment:

# GeoAppliance as a Possible Solution

Geodata are becoming increasingly vital in the control center environment. The centralisation of control centers continues to erode the benefits of operator knowledge of the local area. →
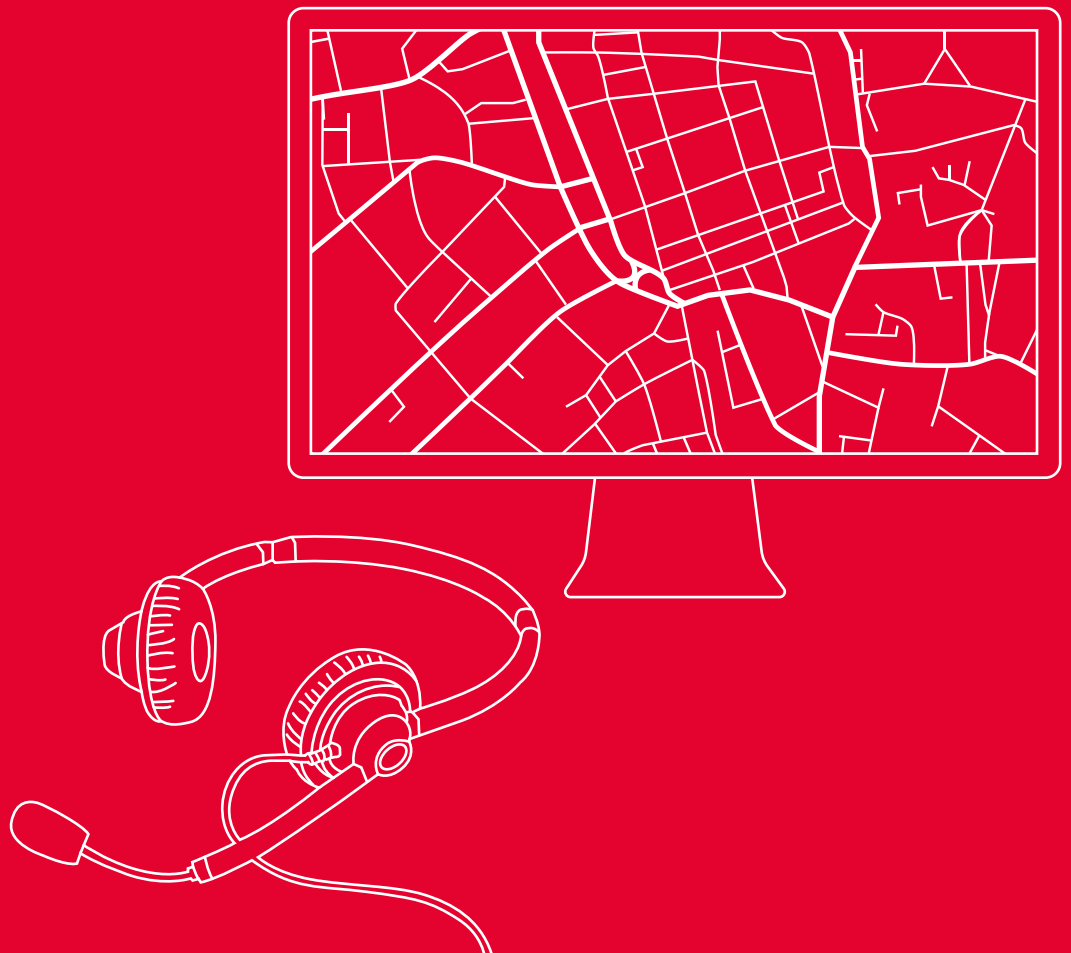
# GeoAppliance as a Possible Solution

"

*"In the future, GeoAppliance will be usable not only as a geodata source for your incident management system, but also for your eCall-compatible communication system."*
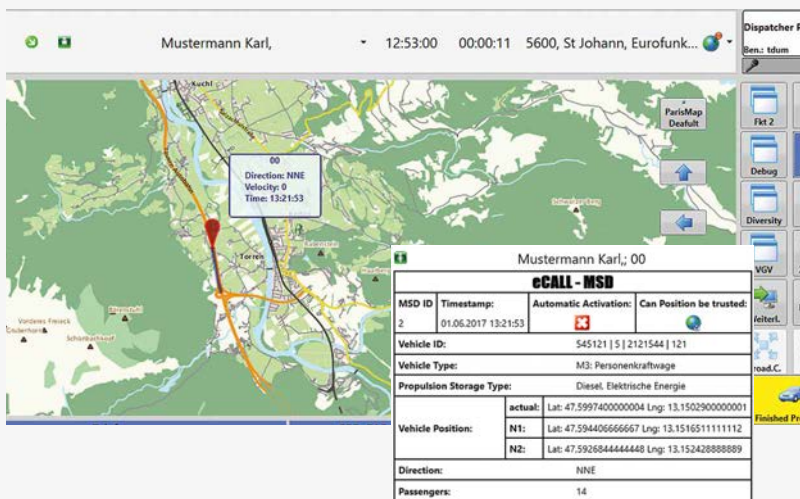


**Fig. 1:** OpenStreetMap



**Fig. 2:** eCall display in IDDS UCiP

High-quality and up-to-date geodata are essential for countless tasks. Geodata are used for applications such as the calculation of approach routes during the dispatch process, navigation of emergency personnel to the location, landing options for helicopters, hazards at the location, overviews of current resource positions and displaying points of interest, to name just a few.

Recent years have seen a sharp rise in the number of different data providers and the quality of the data available.

**However, even though large volumes of geodata already exist, many questions remain:**

- What data sources will I need?

- Where will the data come from?

- Geodata require large amounts of hard-drive space. Where will they be stored?

- How will they be integrated into the control center?

- How will the data be managed and consolidated?

eurofunk's GeoAppliance answers some of these questions. Back in 2015, we started evaluating the software components available on the market in order to offer our clients solutions for the increasing demand for geodata solutions.

Markus SCHAFFLINGER

Professional geodata software installed on its own geodata infrastructure offers numerous capabilities, but often comes with high licensing and hardware costs. In contrast, free open-source software is available as well, which can also answer many of the above questions.

eurofunk's GeoAppliance is a server instance that provides multiple cascaded software components, also known as a tool chain, for geodata processing. The tools can be used to interface and render various data sources and formats and supply these as a standardised WMS/WMTS data stream for a wide range of applications. Here, the QGIS tool is used for centralised data maintenance and management and storage on the GeoAppliance.

In addition to customary data sources, the GeoAppliance can also interface with OpenStreetMap data.

Open-source modules do not require any licence fees. GeoAppliance is also easy to integrate into the virtual infrastructure of an control center.

Recent years have seen several successful implementations of the GeoAppliance tool in control centers as a centralised geodata source.

In the future, GeoAppliance will be usable not only as a geodata source for your incident management system, but also for your eCall-compatible communication system.
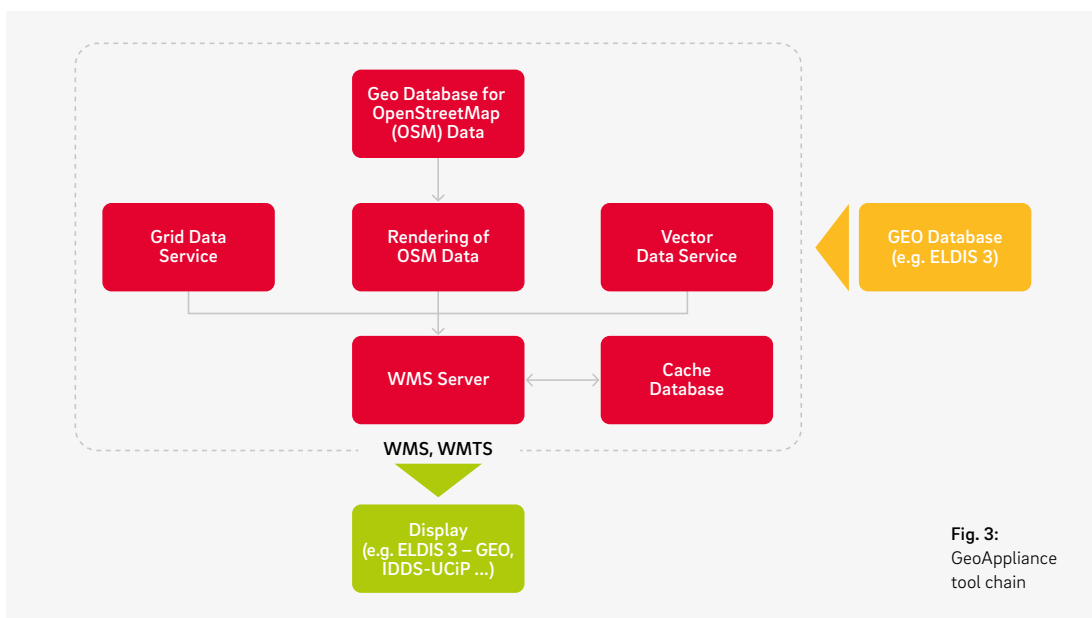
Fig. 3:
GeoAppliance
tool chain

# Control Centers on the Internet: How to be Secure and Open (to the Future)

Hardly a day goes by without another story about an IT security breach. Terms like Trojan horse, virus, malware and ransomware are ubiquitous. The potential hazards of the Internet now appear to be opportunities for some parties. It is easy to overlook the fact that, with sensible and appropriate use of current technologies, as well as cryptographic techniques, the Internet is not incompatible with IT security.

Our control center solutions support government agencies and other organisations in their security responsibilities for the protection of the general public. That is why we view the protection of these control centers as one of our most important tasks.

## INTEGRATION IS ALREADY A REALITY

The image of a completely isolated control center network will soon be a thing of the past. A collection of protection tools prevents unauthorised access, data theft and denial-of-service attacks. Merely securing the network with a firewall with a simple packet filter no longer suffices. By means of a risk assessment (confidentiality, integrity, availability), network planning pays particular attention to the security needs of individual network segments. In this approach, firewalls of different protection classes are deployed, that are interconnected through a secure and dedicated transfer network.

Strict packet filters and an ALG (Application Layer Gateway) on next-generation firewalls provide protection for externally accessible networks (from government networks, the Internet, etc.). eurofunk relies on state-of-the-art technologies to ensure

Martin KASWURM

secure provision of additional external services in the control centers. For instance, multiple interfaces are used to transfer incidents to other control centers or to integrate vehicle terminals.

## REMOTE MAINTENANCE

Fast and extensive remote maintenance options are a key factor in guaranteeing optimal service for our control centers. It used to be common to provide remote maintenance over ISDN lines. These have since largely been replaced by VPN access over the Internet because it is simply no longer possible to provide smooth remote maintenance with ISDN technology at the current data processing volumes. Aside from higher data rates, the benefits of this method include more cost-effective provision and future viability, given that telecom providers will soon discontinue ISDN lines anyway. Standards such as IPSec and TLS are now well established for secure VPN accesses. Together with an appropriate two or three-factor authentication tool, this type of remote maintenance access is highly secure today.

## PROTECTION TOOLS FOR LOCAL NETWORKS

Local networks are secured with firewalls using the latest technologies. Not only must configuration of security gateways take into account the fact that traffic will be restricted and/or scanned, it must also ensure that external access is denied and/or that access is only possible from permitted networks on the management interface. These needs are addressed in the planning and design of BSI basic protection.

## SECURITY BY DESIGN

IT security also receives special focus during the development of eurofunk's in-house software. In this process, eurofunk draws on the work of authorities such as the German Federal Office for Information Security (the 'BSI') and the European Union Agency for Network and Information Security (ENISA). Their recommendations are the basis for the selection and implementation of cryptographic techniques. Security aspects are taken into ac-

count throughout our entire software development process. This approach is often referred to as 'security by design'. IT security is a requirement that is examined separately in design, development and testing.

## NEW FEATURES FOR CONTROL CENTERS

It is not only the advance of digitalization that will change production methods (keyword: Industry 4.0), new technologies in the control center environment will also increasingly open up new possibilities. Without the support of new technologies, it would not be possible to meet the ever-increasing demands on control centers as services providers.

The link with Rescuetrack is a good example of integration with the cloud and other Internet services of this kind. Rescuetrack already offers many control centers highly useful value-added services for incident tracking, and has become commonplace amongst many of our clients. The need for a properly secured connection here has prompted a recent switch to the TLS parameters currently recommended by the BSI in order to meet the latest security requirements.

### Control Center 2.0

Do you want a properly secured control center, but still want to access the capabilities offered by the Internet?

We can support you in implementing new interfaces and modern remote maintenance access methods.
Please do not hesitate to contact us with questions, or even with your own ideas.

# Fun Facts

## 1981
was the year the branch
in Salzburg was established

## 42.500
meters of duplex Cat.7 network cable
was needed for complete restructuring
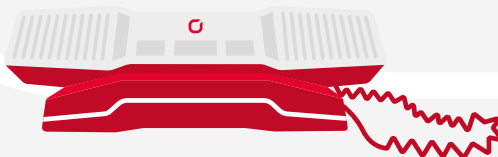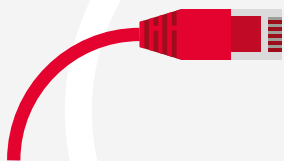of the eurofunk buildings EF8/EF2/EF1

## 1.400
people applied for a job
at eurofunk in 2016

## 56
kilometers of patch cable
was installed in 2016

## 636
eTalks have been
manufactured to date

## 45
different kinds of
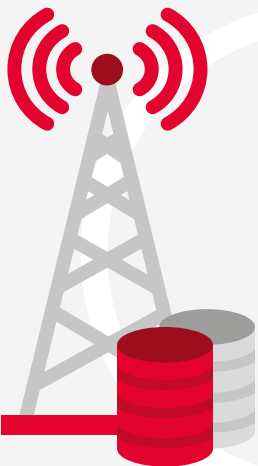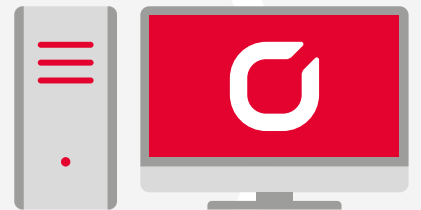seating arrangements
exist in eNNOV8
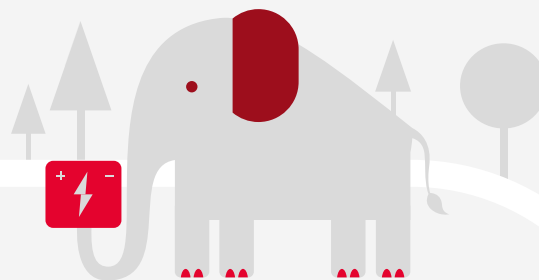
**>500**

specialists work
at eurofunk since
October 2017

**1.029**

computers
were installed
by us at our
customer sites

**4.892**

kilograms was the weight of the
UPS units replaced in the year 2016

**346**

servers were installed
at our customer sites
in 2016

**1.016** kilograms of coffee was consumed
at company headquarters in 2016

# New Technology, New Opportunities: The Karlsruhe ILS*

**Markus SCHAFFLINGER**

**After years of excellent collaboration with the Karlsruhe Municipal Fire Brigade, we are especially pleased to welcome the new, integrated control center in Karlsruhe as a new client.**

In the spring of 2017, the control center for fire and emergency medical services in Karlsruhe successfully migrated to and commissioned their new system.

The core of the system is emc²VoIP, a high-availability, IP-based control center communication system for radio and emergency call processing, and ELDIS 3 PUBLIC, the incident management system software. Here, the obvious choice was to integrate the station alert and building services, as well as to set up interfaces to fire alarm systems and mobile emergency personnel over the Rescuetrack system.

One special highlight in this project is its seamless integration of the metropolyBOS management system by GEOBYTE. This new type of connection provides unprecedented and seamless bidirectional communication with emergency personnel and mobile units in all operational situations. The result is perfect crisis management integration – with emc²VoIP, ELDIS 3 PUBLIC and metropolyBOS all working together in harmony!

We wish the employees of the Karlsruhe ILS many years of enjoyment and success using our new technology!

## OUTLOOK

In Karlsruhe, an additional building is already under construction for the backup and training control center. This control center will accommodate additional workstations for training and georedundant emergency services.

**Facts, Figures, Data**

**The Karlsruhe ILS serves:**
- an area of over 1,250 square kilometres
- 32 cities and municipalities
- approx. 750,000 inhabitants

**Every year it handles:**
- approx. 8,000 fire brigade operations
- 100,000 emergency medical service operations

**For this, the ILS has:**
- 19 primary workstations
- 10 additional workstations on emergency standby for exceptional situations

**Sources:**
http://m.karlsruhe.de/news/db/stadtzeitung/
jahr2015/woche8/bevolkerungswachstum_so_
viele_einwohner.html
https://www.landkreis-karlsruhe.de/index.phtml?mN
avID=1863.9&sNavID=1863.72&La=1



* ILS = (Integrated Control Center)

# Trend-setting technology for the Hessen Police

The Hessen police force is setting new standards for incident management systems. An extensive new project will upgrade both the incident management system (AAO) and the situation and management modules (BAO), and also create a geodata infrastructure (GDI) as a basis for the two systems. As general contractor, not only is eurofunk responsible for the implementation of the project, it will also supply a high-availability, centralised cluster system with decentralised failover levels, to serve as a basis for the web-based control center system.

Soon, this innovative control concept and the underlying cloud technology will provide all police users with user-friendly and context-based access to all relevant information, regardless of their job or location.



**"** "The project scope and the special requirements for this comprehensive solution are future-oriented - and an exciting implementation of this beacon project is guaranteed!"

**"**

our
innovative
teams
are creating

360°
Products
Solutions
Service

for your
control
center

# eurofunk

creating safety by technology

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