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# BUILDING NETWORK TRANSFORMATION



It's always a pleasure for me to introduce our new activities, members and celebrations and give you an insight about a specific technology and how you bring it from our meeting rooms to your company's product roadmap. Our magazine this time focuses on "Network Transformation" and how ETSI, 3GPP and oneM2M are helping build the next generation of ICT networks.

But before we jump into this new year, let me highlight some of the latest 2018 news. A new Chairman was elected at ETSI's General Assembly in November; find more about her in "Inside". A month later, 3GPP celebrated its 20th anniversary in the beautiful town of Sorrento, Italy, which gave us the opportunity to interview their current Chairmen. At the IoT week we showcased a world first: a tractor connected to a car thanks to oneM2M standards, a testament to the active participation of new industry sectors in our committees. 2018, the 30th year of ETSI's creation, was again a fruitful year and as the new year begins, a wind of change is blowing to transform future networks...

But remember, in the 17th century, when over 36,000 workers erected the Palace of Versailles near Paris, "Transformation" referred to carrying enough water to run the fountains of the park – through various innovative and challenging ways – or building the roads to transport the tonnes of required raw material. Today we see Transformation from a somewhat different angle. When talking about our Networks and thinking about Transformation,

**"Welcome all to this new year and this new edition of Enjoy!"**

Network Functions Virtualization (NFV) inevitably comes to mind. As we state later in our "In the spotlight" section, NFV evokes the Transformers series: from plain vehicles into advanced, intelligent, powerful machines.

To anticipate future telecommunication breakthroughs and the fast-paced environment, ETSI needs to innovate. We were first with our Industry Specifications Groups, key in setting some of the fundamentals for 5G standards. You will learn more about some of them in this edition. Also related to NFV, another piece of innovative drive came when we started an Open Source project in support of the development of NFV standards, and Open Source MANO was born. You can read more in "Tech Highlights".

None of this would have come true without our very dedicated staff and all the energy, creativity and passion of our Members.

Because after all, as Henry Ford rightly said, "Enthusiasm is at the bottom of all progress". So may your life be happily enthusiastic for this new year!

**Enjoy reading!**



Luis Jorge Romero,  
ETSI's Director General

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**Enjoy! The ETSI Mag**

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## TCCA and ETSI RENEW PARTNERSHIP



The first partnership between ETSI and the TETRA Association, now TCCA, was signed in 1997 and was renewed in November 2018. The development of the TETRA standard has been an ETSI success story, with TETRA now mature and continuing to receive global acceptance. The cooperation between the two bodies continues and ensures coordination in evolutions of the TETRA standard as well as in work on critical communications in general. ETSI and TCCA have the common objective of developing, maintaining and promoting standardized solutions for critical mobile communications, including but not limited to TETRA, LTE and future 5G standards.

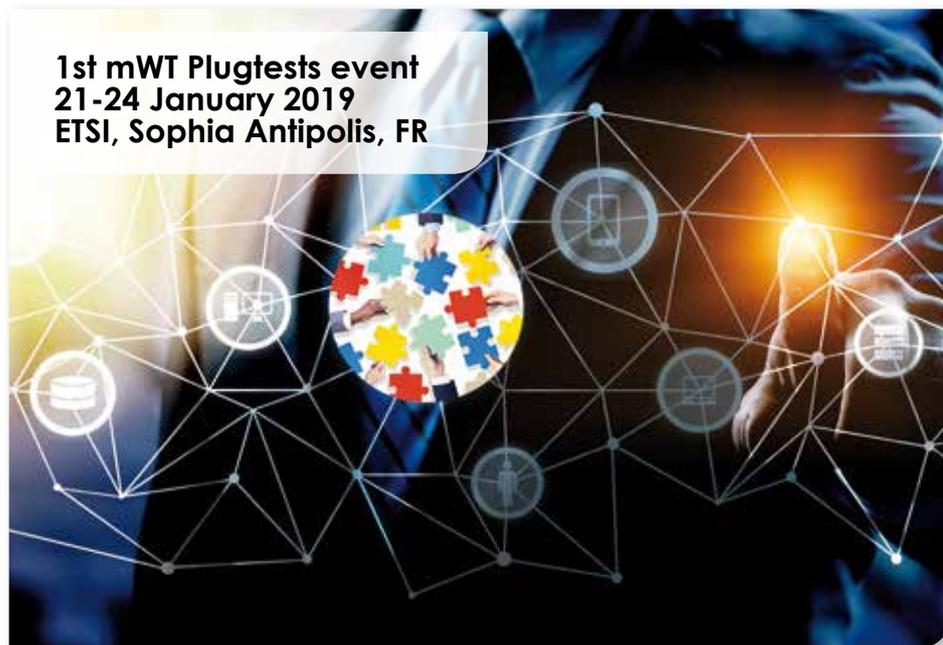
## FUTURENET WORLD Event

FutureNet World, 26-27 March 2019, London, is an exciting new annual event that will address the operators' toughest network and operational challenges as part of their digital transformation. The theme for 2019 is 'Network Automation and AI' and the event offers a unique insight into how operators can evolve their networks and apply intelligence and the use of AI, enabling them to take advantage of the next wave of opportunities and ensure they are ready for the 5G, data-driven world. ETSI is endorsing the event. ETSI speakers include Mostafa Essa, ENI official; Bruno Chatras, NFV Vice Chairman; and Andy Reid, OSM Vice Chairman.

## FIRST PLUGTEST on Millimetre Wave Transmission

ETSI is organizing the first millimetre Wave Transmission (mWT) interoperability Plugtests™ event, 21-24 January 2019 at ETSI in Sophia Antipolis, France. This

event will focus on proving the ability of Software Defined Network (SDN) to operate from an end-to-end service point of view.



It will also for the first time, concentrate on the advantages of using a standard Northbound Interface (NBI) which makes it possible to leverage the vast library of existing data models, eliminates most

interoperability issues, and offers true multi-vendor/multi-technology operation. The event is open to telecom operators and to all microwave and millimetre wave equipment vendors.

## Remembering MIKE WALKER

Professor Michael Walker OBE passed away on the 27th of September 2018. He went from being a mathematics Professor at the University of Tübingen to being a world renowned expert on Cyber and Mobile Security and Cryptography within the telecommunications industry and academia. He will be remembered for his pioneering work on mobile security. In the mid-1980s he was one of the key individuals in the early days of digital communications with GSM (2G). He also defined technical security and cryptography within standards bodies. He was Chairman of ETSI Board and the first Chair of the 3GPP security group. We offer our sincere condolences to his family and friends.





*In our exclusive interview, Ed Tiedemann shares with us his vision of network transformation from the perspective of 5G New Radio and the new potentialities of millimetre wave bandwidth.*

*To you, what's exciting about the upcoming network transformation to 5G?*

I'm excited about the tremendous new capabilities that 5G NR (new radio) brings that can address many different types of services. With NR, 3GPP has developed many of these capabilities, such as ultra-reliable low latency communication (URLLC), from the ground up. It is exciting to work with new industries and their user communities which are eager to evaluate our new 5G platform. Another exciting aspect of 5G is the use of the Millimetre Wave (mmW) bands that will bring a tremendous amount of spectrum to operators. This is all driving the advancement of mmW technology such as transmitters, receivers, and antennas that can fit into handsets already densely packed with many components. Coupled with the highly directional antenna techniques enabled by massive MIMO, the amount of potential capacity is huge.

## Interview Ed Tiedemann

Dr. Edward G. Tiedemann, Jr. is a Senior Vice President of Engineering of Qualcomm Technologies, Inc. He leads Qualcomm's worldwide standardization and industry organization activities. Dr. Tiedemann was instrumental in the design and development of the TIA/EIA/IS-95 CDMA system, and led Qualcomm's, and much of the industry's, efforts in the design and development of the third-generation cdma2000® system. Dr. Tiedemann led the offline industry

group on M2M convergence, which resulted in oneM2M, of which ETSI is a founding partner. Before joining Qualcomm in 1988, Dr. Tiedemann was at MIT's Lincoln Laboratory, where he worked on millimetre wave satellite communications systems. In his spare time, he is involved with several universities, is active in historic preservation, and is on the board of Board of Overseers of the Peabody Essex Museum.

As for mmW propagation issues, our experiences in an outdoor environment are more positive than initially expected, and we expect to obtain good outdoor coverage using existing cell sites. Outdoor to indoor coverage is a challenge, but the removal of most of the outdoor traffic from the lower frequency bands can result in much better performance and user experience for all.

***We have heard that 5G will become commercial in 2019; is it going to happen?***

Making a new generation of mobile technology, be it 3G, 4G, or 5G, a commercial reality is no small feat. It requires the entire mobile ecosystem to

**Our experiences of mmW in an outdoor environment are more positive than initially expected.**

work closely together. For 5G, we are in very good shape. 3GPP did a tremendous job pulling together NR from the first workshop in September 2015 to the acceleration resulting in the completion of Non-Standalone (NSA) capabilities in December 2017 and completion of Release 15 including Standalone (SA) in June 2018. Companies are now closely cooperating with myriads of interoperability testing and field trials that are leading to NR compliant deployments. By the time this article is published, several operators will have announced commercial NR service. We foresee commercial 5G NR deployments happening on a global scale in 2019 in both sub 6 GHz and mmWave spectrum bands.

***If you had to pick key use cases in 5G, what would you select?***

5G is a unifying connectivity fabric that will connect virtually everything around us. For the first phase of 5G deployments, based on 3GPP Release 15 specifications, we see 5G enabling new and enhanced mobile broadband use cases. A more capable smartphone

**We foresee commercial 5G NR deployments on a global scale in 2019.**

is just one example. 5G will enable more immersive mobile extended reality (XR) experiences. We envision split XR, which reduces the processing burden on the handset by transferring some of this processing to the edge cloud. The low latency requirements of XR fit nicely with the low latency provided by the NR air interface and edge cloud processing. As a result, we can move XR from today's tethered environment to true mobile usage while providing photorealistic graphics and visuals. The second phase of 5G, based on 3GPP Release 16, will expand 5G to new industries such as autonomous driving with 5G NR C-V2X and dynamically configurable factories with 5G NR wireless industrial ethernet.

***Can you share with us your product roadmap for 5G?***

At Qualcomm, we are working on products that deliver modem-to-antenna capabilities across all 5G spectrum bands. This includes the world's first announced 5G modem family, the Snapdragon X50, as well as antenna modules that can support global 5G

**5G will enable more immersive mobile extended reality (XR) experiences.**

frequency bands in both mmW (QTM052) and sub-6 GHz (QPM56xx). In addition, we are also developing a 5G small cell solution (FSM100xx) that can be deployed to enhance 5G coverage for both indoor and outdoor deployments.

***How do you see ETSI's role in the 5G network transformation?***

In 1998, the staff of ETSI and other visionaries in the 3GPP Organizational

Partners had the foresight and put forth the effort to bring together 3GPP.

This commitment has continued until today and will continue, I expect, for a long time. The processes and policies which have been put into place have fostered tremendous innovation, and through the cooperation of the many diverse companies involved and the leadership of 3GPP, have managed to develop critical specifications on time.

The impact upon society through the development of 3G, 4G, and now 5G has been tremendous. It is amazing how many people relate to the technology by having seen billboards saying "4G-LTE" or having heard of 5G.

**One trend we see today is the convergence of mobile with AI, transforming the wireless edge.**

This is something that ETSI and the entire 3GPP community should be proud of. What ETSI calls "World Class Standards" are the "World's Standards" for wireless communications.

***What about the future evolution of communication networks?***

Working in this fast-paced ICT industry is tremendously exciting. We will continue our quest to wirelessly connect virtually everything around us. Clever people will exploit the new capabilities that we have brought to 5G.

One trend we do see today is the convergence of mobile with AI, transforming the wireless edge that is opening doors to new opportunities and use cases. I expect that mobile technology evolution will surely continue, resulting in many 5G releases of the 3GPP specifications. I am confident that we will move onto 6G in about a decade, although it's hard to predict what it will entail.

All in all, the future for mobile communication is bright, and I am excited to be part of the global and exciting effort to push mobile technology evolution and its standardization forwards.

# Welcome to our **NEW** members

## **Aria Networks, United Kingdom**

Aria Networks provides AI-based solutions for automating and optimizing the supply chain that delivers services for digital economy service providers and data centre operators. It is a technology-agnostic software provider for telecommunications, cloud, data centre, over-the-top (OTT) and social network service providers.

## **BTL Inc., China**

BTL offers a standard testing establishment with professional technology to assist customers in obtaining various certifications rapidly. BTL provides a variety of testing services and reports, certification application, and technology and standards consultancy. Service products range from ITE, communication, home appliances and portable electric machinery instruments to industrial electronic products.

## **Bundesdruckerei GmbH, Germany**

Bundesdruckerei is a manufacturer of banknotes, stamps, identity cards, passports, visas, driving licences, and vehicle registration certificates. It is a one-stop shop provider for the secure organization of digital transformation. It ensures that companies, authorities and entire states can rely on the secure protection of personal identities.

## **CEA LETI, France**

The French Alternative Energies and Atomic Energy Commission (CEA) operates in defence and security, low carbon energies, technological research for industry and fundamental research. Leti, a technology research institute at CEA Tech, pioneers micro and nanotechnologies in a wide range of markets. The institute works in the areas of healthcare, energy, transport and ICT.

## **certSIGN, Romania**

certSIGN develops software for information security and information systems protection. The organization helps protect electronic information, from online contracts and transactions to information stored on workstations and servers, to individuals and legal entities. CertSIGN is recognized as a European Qualified Trust Service Provider and appears on the European Trusted List.

## **Cochlear, Belgium**

Cochlear has delivered 30 years of implant innovation to hundreds of thousands of people. The organization provides devices to help people to hear and be heard – empowering them to connect with others and live a full life. Cochlear provides innovative and high-quality products and services to deliver a lifetime of hearing outcomes.

## **EDCO, United States**

Enterprise Data Center Operators, EDCO, is formed by a number of large organizations. It monitors protocol changes that affect large data centres at the IETF. EDCO represents the interests and issues important to the network deployment, operation and design of large, complex enterprises and other large data centre operators at standards bodies and regulators.

## **Itk AVtobvS SARL, Switzerland**

Itk is active in computer consultancy activities. It provides services for post-quantum symmetric cryptography, secure and GDPR-compliant smart cities, smart and secure mobility management, and 3D printing as a service.

## **RunEL, Israel**

RunEL is a technology leader in the 5G mobile wireless revolution. The company vision is to improve life experience by connecting people and things using superior technology. Its mission is to introduce the revolutionary Sparq-2020 chipset for 5G infrastructure that will become a significant player in Ultra Reliable Low Latency Communication (URLLC).

## **Sasken, India**

Sasken is a specialist in Product Engineering and Digital Transformation providing concept-to-market, chip-to-cognition R&D services to global leaders in semiconductor, automotive, industrials, smart devices and wearables, Enterprise Grade Devices, SatCom, and transportation industries. For over 29 years and with multiple patents, Sasken has powered over a billion devices through its services and IP.

## **Scania CV AB, Sweden**

Scania is a manufacturer of trucks, buses and diesel engines for heavy vehicles as well as marine and general industrial applications. Work is done in strategic partnerships as the challenges faced require cooperation with governments, universities and stakeholders in the commerce and transport infrastructure. Current involvement includes smart and safe transport, energy efficiency and electrification.



### **Secure Chorus, United Kingdom**

Secure Chorus is a not-for-profit membership organization serving as a platform for multi-stakeholder cooperation to develop forward-looking strategies, common technology standards and capabilities in the field of information security. Its membership brings together governments and supranational organizations, from global enterprises to technology start-ups, academic institutions, regulators, trade associations and standards bodies.

### **Sensus UK, United Kingdom**

Sensus is a global leader in utility infrastructure systems and resource conservation. It aligns people, products and processes to help public service providers do more with their infrastructure. It applies technical and data-driven insights to deliver new levels of efficiency, responsiveness and analytical capabilities while reducing environmental impact.

### **SYSOCO, France**

SYSOCO is the French leader in the integration of radiocommunications systems and Smart Connect solutions in order to optimize and secure the communications of operators of smart cities and Industry 4.0. Relations are maintained with major radiocommunication equipment manufacturers and the company maintains lasting partnerships in the field of industry.

### **TekVizion PVS Inc., United States**

TekVizion PVS, Inc. provides testing services. It focuses on Voice over Internet Protocol and unified communications services and accelerates the connected business to create competitive advantage. The company provides SIP trunk turn up and cloud testing services. Its customers include Panasonic, Unify, Microsoft, Cisco, NEC, and Mitel.

### **Truphone, United Kingdom**

Truphone is a global mobile network with a centralized services model, partnering with mobile networks in each country. It engineers better connections between things, people and business. The company has invested in state-of-the-art SIM software, intuitive management platforms and a powerful global network to achieve this.

### **UNIVBRIS, United Kingdom**

University of Bristol has had a long history, a dedicated support infrastructure, and experienced staff for participating in EU projects. It is a member of the “Worldwide Universities Network” and of the Russell Group of universities. The academic quality of the University is reflected partly in the Nobel Prizes and Fellowships associated with its community.

### **UWB Alliance, United States**

UWB Alliance is a global, not-for-profit organization to establish Ultra-Wideband (UWB) technology as an open standards industry. It seeks to drive growth through end-to-end, vendor-agnostic interoperability programmes to provide accurate location, navigation, tracking, security, imaging, sensing, and communication to IoT and industry 4.0 applications across multiple industries.

### **VMware Inc., United States**

VMware software powers the world’s complex digital infrastructure. VMware seeks to engineer new ways to make technologies work together seamlessly. It applies principles of virtualization and software innovation to securely connect, manage and automate the world’s complex digital infrastructure. The company seeks to apply these principles to IoT, edge computing and Artificial Intelligence among others.

### **Wireless Power Consortium (WPC), United States**

The WPC is a group of leading manufacturers in a wide range of industries that understand the untapped potential of wireless charging. This includes leading makers of mobile phones, consumer electronics, batteries, semi-conductors, components, wireless power technology and infrastructure – such as wireless operators, furniture and automotive parts.

*In this interview, Professor Demestichas introduces Wings ICT, a Greek Small and Medium Enterprise developing solutions for wireless solution. He is also addressing the challenges ahead.*



# Interview Professor Panagiotis Demestichas

Professor Panagiotis Demestichas holds a Ph.D. degree in Electrical Engineering from the National Technical University of Athens (NTUA). He teaches networks, services, queueing systems, network design and management at the University of Piraeus, School of ICT, Department of Digital Systems, Greece. He conducts research on 5G, clouds, IoT, nanosystems and wearables, SDN/NFV, and smart energy/transportation/health/cities.

Additionally, his expertise has led him to work on system development for WINGS ICT Solutions and its spin-off Incelligent. He has published numerous articles and research papers and is a member of the Association for Computing Machinery (ACM) and a Senior Member at IEEE.

**Professor Demestichas, can you tell us more about WINGS ICT Solutions' activity?**

WINGS is a company that is oriented to the delivery of solutions for verticals. Our foundation comprises wireless technologies such as 4G and 5G, IoT, AI, big data and cloud technologies. We are quite advanced in the area of utilities with energy, water or gas, food security and safety involving smart aquaculture, smart city applications to address air quality management or assisted living instructions like parking.

More recently we have started to target factories and the logistics and transportation sector, through mobile robotics. We are also proud to have collaborations with large companies such as IBM, Intrasoft and Pole Star UK (maritime), while also developing our platforms, creating partnerships with companies such as OTE, Ericsson and Nokia, and looking at the future through research. We have grown as a company and now have more than 100 employees.

**In your opinion, which key technologies drive network transformation?**

Key technologies are IoT and big data, for acquiring data; Artificial Intelligence, to make sense out of the data; and 4G evolution and 5G, for delivering and obtaining rich information streams and associated insights, at the needed speed and reliability.

**The network will become an ecosystem that can deliver "intelligence" and not just bits.**

We believe that the network will be dramatically transformed. We see the network as an ecosystem that can deliver "intelligence", and not just bits, in the coming years. In other words, we foresee that there will also be tighter couplings between the network and the intelligent applications delivered. This will also be

evident in the business domain, where we will witness close collaborations between operators and vendors with SMEs focused on vertical applications.

The network can become an ecosystem that will also host, manage and own intelligent applications, in a broader way than today.

**ETSI can help in the establishment of ecosystems that will stimulate business interactions.**

**And how do you see ETSI's role in that transformation?**

The key role will be in standards, but there are also further roles to play!

Standards will always be very important and the core of the activities. Even though we are in fast-moving times, and standards take time and effort, we need to acknowledge that they are essential if we want openness in the long run.

However, there are also further areas.

ETSI is doing amazing work in harmonizing research streams and bringing them closer to standardization, paving the way for potential future standards.

Moreover, I think that ETSI, with its working structures and reputation, can help in the establishment of ecosystems that will also stimulate business interactions. As an example, ETSI events should be seen as an opportunity for interactions, not only between infrastructure players, but also with vertical domains.

**Speaking of events, what was your involvement at the ETSI IoT week?**

We made a demonstration on aquaculture management and optimization. This is one of the areas where we are investing our energy, and for which we have high expectations, due to the social and financial added value. It is important to have sufficient quantity of fish in an appropriate time frame. Current supplies cannot meet the EU demand;

in addition, there is also a demand for exports overseas, in Asia and the U.S. for instance. An excellent quality is also an important factor.

Therefore, our team has developed a system that can monitor and optimize fish quality based on sensors, embedded intelligence, predictive analytics, and proper visualizations. We are in the process of pursuing further partnerships in that field.

**What role does Artificial Intelligence play in your development?**

We have developed skills that are now collectively called AI (Artificial Intelligence); we could call them cognitive systems. All this work forms the WINGS ATHENA platform, from which we instantiate our solutions, which are more tailored to the various vertical domains.

We have teams working on sensors and embedded intelligence, resource orchestration, data management, insight and prediction generation, and intelligent decision-making and visualizations.

**Professor Demestichas, what challenges do you foresee for the future networks?**

There are many, and that's a good thing, but we need to address them to make the future a brighter one! A shift in mindset is necessary.

**To address the challenges of future networks, a shift in mindset is necessary.**

All of us, working around or on networks, have to start thinking in a manner that will lead to actions which will constitute the confluence of different streams: infrastructure and verticals, business and technology, research and standards, and regulations and laws. We should try to challenge our work from various perspectives, from a societal, business and technical point of view. I believe that through this something good can come out.

# Open Source MANO: Enabling 5G Automation

***OSM today offers the necessary means to handle distributed Network Services and Network Slices over heterogeneous environments. Such networks offered as a service can be operated from a single pane of glass in OSM.***

Deploying and operating a large distributed network has traditionally been an extremely complex task, involving a plethora of pieces of equipment, protocols and connections, where element heterogeneity and segmented views per technology (not necessarily per service) have been the norm, conditioning the management procedures to accommodate that reality.

With the foundation of ETSI NFV (network function virtualization) in 2012, a unique opportunity emerged to make networks more flexible and operable at scale, leveraging the homogeneity and extreme elasticity that virtualized environments can provide. Thus, in the same manner that cloud-computing concepts made a significant impact in IT, network function virtualization is expected to play an equivalent role with respect to networking. In such a revolution, orchestration is critical to realizing this view of service

agility and continuous optimization that a fully automated network would require.

The goal of ETSI Open Source MANO is the development of a community-driven production-quality orchestration stack for telco services, capable of modelling and automating real telco-grade services, with all the intrinsic complexity of production environments. A community Open Source project was intended here to accelerate maturity of the technology and standards and enable a broad ecosystem of virtual network functions vendors. It was also meant to test and validate in an agile fashion the interoperability of the orchestrator with the other components it has to interact with: commercial NFV infrastructures and Network Functions.

A key practical advantage of OSM's approach is that it vastly minimizes integration efforts through a well-known information model, aligned with ETSI NFV,

capable of modelling and automating the full lifecycle of network functions (virtual, physical or hybrid), network services and network slices, from their initial deployment (instantiation, Day-0, and Day-1) to their daily operation and monitoring (Day-2). Moreover, OSM's information model is completely infrastructure-agnostic, so that the same model can be used to instantiate a given element (e.g. virtual network functions) in a large variety of Virtual Infrastructure Managers (VIM) types and transport technologies, enabling an ecosystem of Virtual Network Functions models ready for their deployment anywhere.

In addition, OSM provides a unified Northbound Interface, based on NFV SOL005, which enables the full operation of the system and the Network Services under its control.

Since its creation in 2016, OSM has produced six releases with growing functionality and maturity, including the aforementioned multi-VIM (OpenStack, VMware, OpenVIM, Amazon Web Services), multi-SDN (ODL, ONOS, Floodlight) and multi-site capabilities, together with advanced service modelling features such as Enhanced Platform Awareness, underlay automation, virtual network function scaling, and monitoring. Recently, OSM launched its latest release, Release FIVE, which provides key features to successfully enable 5G use cases, such as the support of network slices, dynamic creation of inter-datacentre connections (infrastructure-agnostic), orchestration of physical and hybrid network functions, VNF-level monitoring, policy-based closed loop... and a large list of enhancements in terms of modelling, usability, reliability and design time tools.



Figure: OSM scope as End-to-End Service Orchestrator

■ Francisco Javier Ramon Salguero,  
ETSI's OSM chair

# First Hackathon Series for Edge Computing

*Bringing developers in China, Germany and Italy together to trial edge computing solutions, ETSI's Group on Multi-access Edge Computing has launched its first MEC hackathon series and is ready to organize the next one.*



**MEC Edge Cloud 3D  
Holographic E2E Service  
Solution in Beijing**

The ETSI Multi-access Edge Computing group organized their first MEC hackathon series in Europe and China to engage with application developers and let them demonstrate their applications with ETSI MEC Application Programming Interfaces (APIs) in a variety of use cases.

The events took place simultaneously on 18-19 September in Beijing, Berlin and Turin. The automotive sector being one of the key areas for edge computing and 5G, the main focus of the events was in-vehicle infotainment. Other applications demonstrating the benefits of MEC were also welcome.

The Berlin hackathon was organized by ETSI and supported by Huawei, Intel,

ISMB, I3P, Saguna, VIAVI and Vodafone. The winner, EDGE GAP, demonstrated a solution for optimization of multi-player gaming. The Match Maker app was installed on both a Huawei MEC server running apps in containers and a Saguna server running apps in virtual machines. The winner of the Turin hackathon, JARVIS, put forward a solution that exploited MEC's performance capabilities within vehicle collision avoidance systems.

The event in Beijing was hosted by China Mobile, China Telecom, China Unicom and Huawei. Nine developer teams representing the Chinese IT sector, research institutes and mobile operators were accepted to the finals

to showcase their solutions to the jury. All finalists were rewarded, their applications covering a variety of edge computing use cases, from automotive Advanced Driver Assistance Systems (ADAS) to real-time object recognition and intelligent consumer advertising.

The experience from the first hackathons was highly encouraging. The events proved their value in directly engaging with the developers for a valuable dialogue. ETSI ISG MEC has an open call for companies to organize hackathons on MEC-related topics, so join us!

■ *Dario Sabella, ETSI's MEC ISG secretary and Sami Kekki, ETSI's MEC ISG vice chair*

# OSM Release FIVE is 5G-ready



Open Source  
**MANO**

With this new Release, Open Source MANO delivers 5G-ready end-to-end service orchestration across virtual, transport, physical and hybrid domains. The new micro-service architecture has eased the seamless integration of new features needed for 5G and edge orchestration. These include 3GPP™

5G Network Slices management capabilities and a Wide Area Network Infrastructure Manager (WIM) plugin model to enable dynamic multi-data centre connectivity over different transport networks. Service Function Chaining (SFC) has also been extended, making OSM the orchestrator of choice for SFC automation in other projects, such as OPNFV. OSM Release FIVE also provides policy-based closed loop scaling, triggered by metrics from the infrastructure and the network functions. While continuing the alignment and feedback to ETSI NFV, this release provides significant improvements in terms of usability, reliability and design-time tools, enabling the modelling and operation of complex network services.

# Security standard for enterprises and data centres



ETSI's committee on Cybersecurity has released a new standard that enables vital functions for data centres and enterprises, called Enterprise TLS (Transport Layer Security) or "eTLS". eTLS is a protocol that supports secure TLS communications whilst allowing troubleshooting, demonstration of regulatory compliance, detection of attacks (such as malware activity, data exfiltration, DDoS incidents), and more, on encrypted networks.

eTLS allows network operators to meet their service agreements and legal mandates while protecting users from being forced to revert to older, less secure protocols. Operators and users also gain visibility over who has access to their data.

This standard, TS 103 523-3, called Profile For Enterprise Network and Data Centre Access Control, is one of the three Middlebox Security Protocol

# Next Generation Protocols launches Flexilink specification

The ETSI group on Next Generation Protocols has just released a new specification, GS NGP 013, defining Flexilink, which specifies user plane packet formats and routing mechanisms that allow core and access networks to support the new services proposed for 5G, including the lowest possible delays for ultra-reliable low latency communication (URLLC). This specification offers an efficient header compression mechanism as the headers carry an index into the routing table and all other information is thus sent only once for each flow instead of in every packet. The control plane messages can carry much more information than will fit into packet headers, including authentication and other security features, and will support multiple address formats such as IPv4 and IPv6. Adding a new form of addressing only needs a software update to the control elements, and no change to the hardware. Any part of an IP network can be replaced by Flexilink without affecting the rest of the network.

specifications to be developed.

eTLS was driven by a huge industry need, outlined in the ETSI report TR 103 421, which recommended providing a series of standards-based solutions to the evolving needs of industry, networks and middleboxes such as firewalls. eTLS is the first published part of these recommended standards.



# BUILDING NETWORK

# TRANSFORMATION

Network transformation today goes beyond what we have seen in other industries when applying digital transformation. Networks are undergoing a change to the very nature of the infrastructure itself. We could even talk about a complete transformation of the kind that we adored in the Transformers films: from plain vehicles into advanced, intelligent, powerful robots.

Network Function Virtualization (NFV) is definitely the technology that initiated the boom of network transformation and a key for 5G services. Virtualization comes naturally from the “cloud” of the IT world applied to a heterogeneous network infrastructure based on disparate, ad-hoc equipment.

NFV brings a lot of benefits to the industry, although when the ETSI NFV group began, a certain number of the stakeholders were sceptical. The journey of NFV is a fascinating story that you can read about on pages 14 and 15. And the NTT Docomo showcase brings NFV to implementation, anticipating that 75% of their network will be based on virtualized network function by 2020; read more on page 16.

# Building Network Transformation with ETSI NFV

*Network transformation has become a pervasive mantra in the industry, an industry that still longs for the Golden Age of the mobile boom at the turn of the century and that has been looking for a new battle cry to galvanize the ranks and bring the excitement back to the network technology field.*

## A bit of history

The word “transformation” is somehow rooted in the various digital transformations other industries are facing, but in the case of networks we are talking about a much deeper change, as the process is focused on changing the very nature of the network infrastructure itself. In this sense, we could even talk about a change like the one in the Transformers series: from plain vehicles into advanced, intelligent, powerful robots.

Network transformation is like the one in the Transformers series: from plain vehicles into advanced, intelligent, powerful robots.

We can date the start of the transformation back to 2012, when several lab heads in the companies that have started to work on virtualizing network infrastructures got together in Paris and explored how to consolidate the extremely promising results they were achieving. Standardizing the application of these virtualization technologies to network service provisioning and management seemed the best way to achieve this consolidation. Network Function Virtualization, NFV, both the ETSI Industry Specification Group and the term itself, was a consequence of this

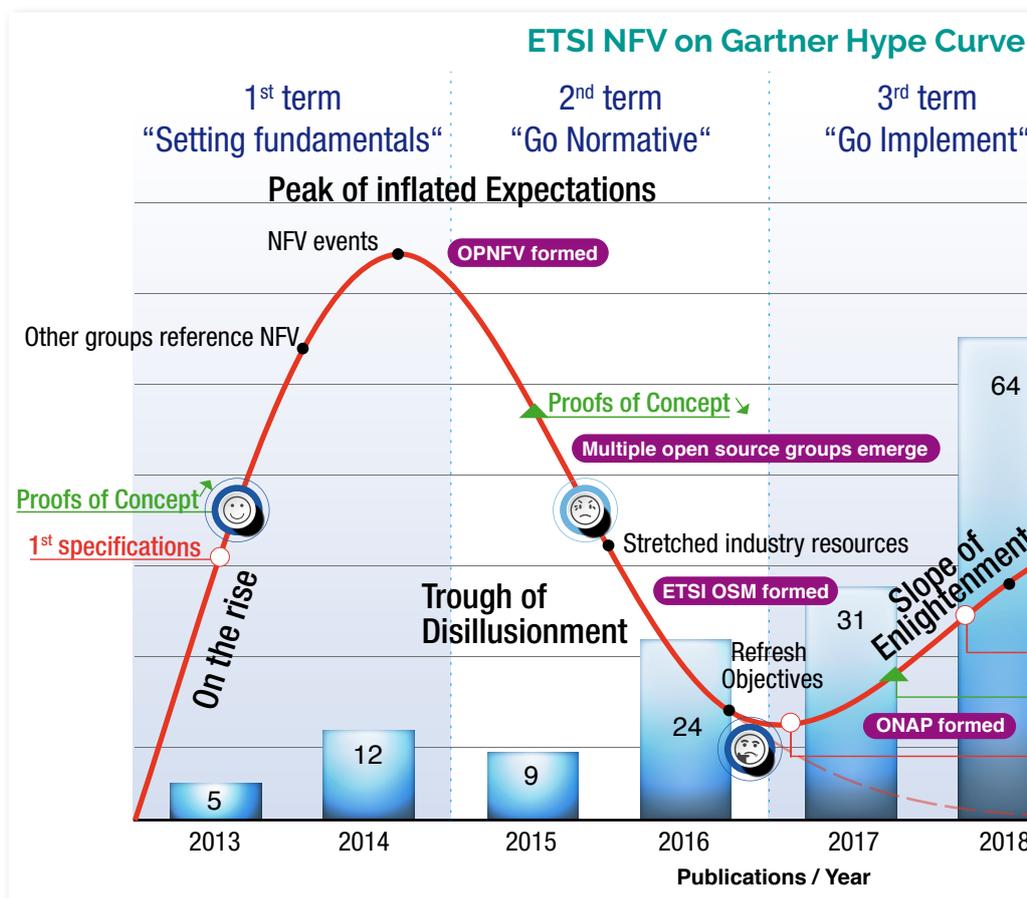
meeting. The concepts, framework and applications brought about by the NFV action, aimed at achieving similar goals as those provided by cloud technologies in the IT space, have been the core of network transformation since then.

## The hype is coming

From that moment on the NFV wave grew, first on its own and afterwards as part of the wider network transformation, as a trend that promised to not only renew infrastructures and technologies but to

NFV went through a bloom of creativity, extreme expectations and some disillusionment.

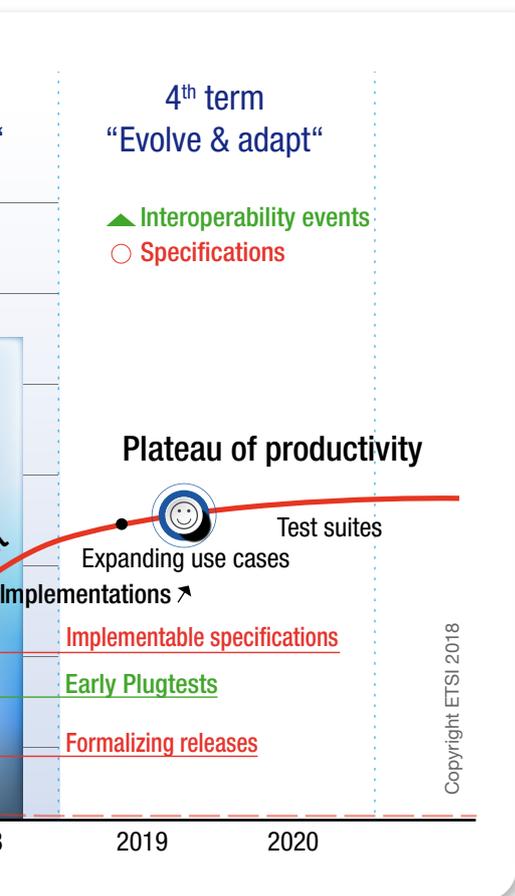
change, as an archetypal paradigm shift, the foundations of how network services are created, managed and consumed. As with many, if not all, of these paradigm



shifts, NFV has followed to some extent a hype curve, passing through a rather steep growth of interest that included a bloom of creativity (and strange ideas), a peak of extreme expectations, and then some degree of disillusionment as some of the most inflated hopes became less clear and seemingly competing approaches flourished. We are confident we are approaching the peaceful plains of actual technology productivity. In any case, it is clear NFV was the fuse that initiated the boom of network transformation.

## NFV for today and tomorrow

In short, NFV intends to apply the well-established IT virtualization technologies to consolidate the heterogeneous network infrastructure based on disparate, ad-hoc equipment onto industry-standard high-volume servers, storage, and packet switches. This involves implementing network functions in software which can run on such a homogeneous, industry-standard infrastructure. This software can then be moved to, or introduced in, various locations in the network as required. NFV



implies the simplification of the roll-out of network services, reducing deployment and operational costs, and facilitating network management automation. While NFV was originally conceived to help

**NFV is a necessary ingredient in the development of next-generation networks, and in particular the emerging 5G.**

network service providers in the search for cost reduction and agility, it has proven to be an essential tool to enhance how these services are requested and consumed by users. And it is a necessary ingredient in the development of next-generation networks, and in particular the emerging 5G.

## Setting fundamentals

ETSI NFV started by building a basic framework to provide a common ground for all the people involved, including the agreement on common terms, essential for addressing the change that was taking place. This effort in building the fundamental NFV framework took place in parallel with a strong activity to demonstrate the feasibility of the NFV

**The groundbreaking proposal was received with some degrees of scepticism.**

concepts and principles, especially relevant for a ground-breaking proposal that was received with a high degree of scepticism by a majority of the industry.

This constituted what ETSI NFV called Release 1, and not only produced the orchestration diagram that has become the main NFV banner, but also gave the community this craving for early practical assessment that has been a key characteristic of its activity since the beginning.

## The next step: automation?

Once the fundamentals were set and proven to be solid, it was time to undertake a detailed exploration of network virtualization and its requirements in terms of orchestration, management, performance, reliability and security.

The result of this work was ETSI NFV Release 2, which gives a set of detailed specifications addressing the aspects mentioned above, providing a final consolidation of the essential concepts established by Release 1. After this set of concrete specifications, an equally important challenge remained: the integration of the NFV procedures with operational practice, so NFV-enabled infrastructures and services could be incorporated into actual industrial processes and provide a clear migration path. This was the main goal of Release 3, which the group is about to complete, and which is laying the foundations for exploring other ambitious goals around

**NFV was at the origin of the transformation wave, and is still on it, in a quite exciting ride to the future network.**

the next frontiers of networking, such as automation and the applicability in new environments enabled by next-generation networks.

NFV was at the origin of the transformation wave and is still on it, in a quite exciting ride to the future network.

■ *Diego Lopez, ETSI's NFV ISG chair*

# NTT virtualizing its network for a shorter time to market

*NTT DOCOMO started introducing network functions virtualization (NFV) into its commercial network in March 2016 to achieve a stronger and more flexible mobile network with off-the-shelf servers. Read more about the outcome.*



DOCOMO's approach follows a gradual migration plan re-using existing assets such as network functions, operations support systems, and internal operation workflows, alongside the introduction of a multi-vendor infrastructure, management and orchestration system to cope with the NFV-specific aspects.

By introducing NFV into its network, DOCOMO is already achieving reduction of capital expenditure and increased efficiency such as better connectivity, quality of the network, and shorter time to market. But to move even further, DOCOMO is accelerating the network migration to include more types of Virtualized Network Functions (VNF) and enhance the operations support systems and NFV management and orchestration (MANO) systems. As of now, 12 network node types have been virtualized and deployed in the field, including

Evolved Packet Core and IP Multimedia Subsystem. DOCOMO expects that 75% of the network will be based on virtualized network functions by 2020.

DOCOMO's NFV commercial deployment is based on the ETSI NFV architectural framework. ETSI NFV-defined reference points, interfaces, and models enable interoperability among the NFV functional blocks, which help operators integrate each component more independently.

In DOCOMO's case, virtualized network functions and their managers, NFV infrastructure and the remaining NFV management and orchestration components come from different providers. This setup allows the operator to leverage a rich ecosystem where solutions can be integrated based on different requirements and indicators such as quality, performance, and cost.

The deployment of NFV into the network has so far been a success. Nonetheless, as is usual in such a network transformation, the early deployment steps also came with their own challenges as the standards and solutions were evolving.

DOCOMO is starting to consider how to evolve the current deployed NFV network to make it more reliable against failures and natural disaster impacts, while at the same time taking into account the expected evolution of virtualized network functions and their operation. For instance, further cloudification of VNFs is expected, considering the advent of 5G networks. This will also have impacts on the NFV infrastructure, which needs to evolve to achieve a more efficient resource usage, improved agility in service deployment, and operations automation. It is expected that ETSI NFV test specifications will reduce the integration efforts of interoperable multi-functional/multi-provider NFV systems and the verification processes in the operator's lab. But to achieve this, further specification work to remove dependencies between the virtualized network functions, NFV-MANO and infrastructure is needed, such as workflows for all the procedures that are needed for the lifecycle and configuration of the virtualized network functions and network services.

DOCOMO will continue driving the NFV journey together with other network operators and network equipment providers by cooperating and sharing NFV best practices

■ Yuya Kuno, Engineer of the network management and orchestration group of the core network development department in NTT DOCOMO.  
Yoshihiro Nakajima, Manager of the network management and orchestration group of the core network development department in NTT DOCOMO

# 5G - Transforming the Network: the NGMN Vision

**The objectives for 4G primarily had to do with data throughput and cost per bit to support mobile broadband (residential) end-users. 5G is going to change the situation substantially.**

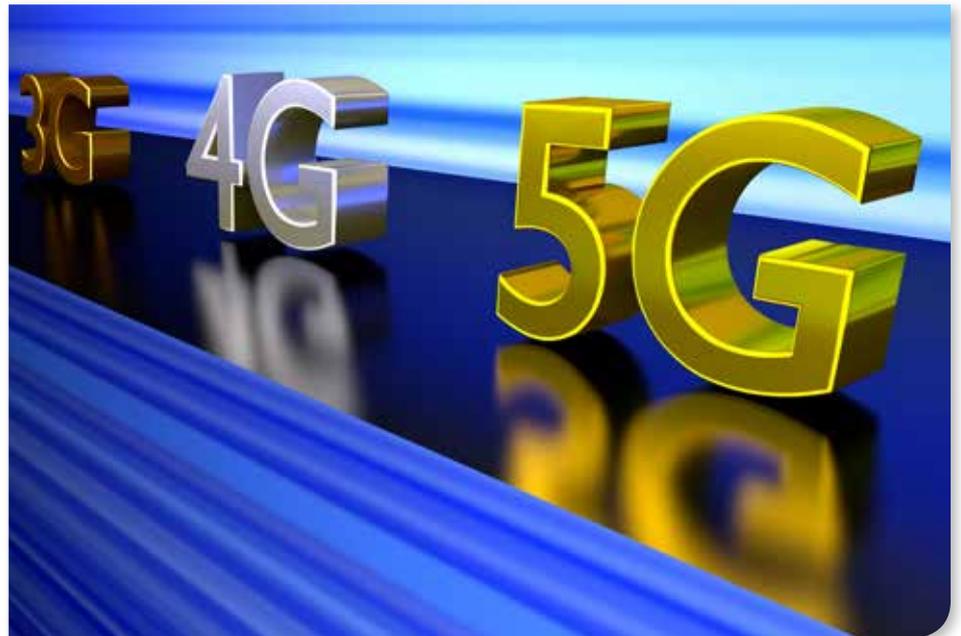
5G will not only deliver dramatically increased network capacity and faster connection speeds, it will ultimately bring a step change in the capability of networks to deliver new mobile applications like AR/VR and enriched content. It will enable specific services demanded by enterprises like Vertical Industries with ultra-reliable, low latency communication (URLLC) and massive IoT.

Furthermore, 5G introduces a new technology paradigm. Where today networks deliver basically the same service to everyone everywhere, 5G will deliver tailored capabilities and performance for a specific use case at a given point in time and location. Services will get their specific “slice” of the network; network virtualization, alongside further convergence of fixed and mobile networks, will enable services-on-demand.

As never before, mobile networks will go through a tremendous transformation, both on the radio and on the core. NR (new radio) and MEC (edge computing) are key enablers for low latency and high speed while a virtualized core, based on NFV and SDN, supports network slicing to adapt to user demands.

Highlighting the key elements of future mobile networks – as NGMN is addressing them in its current work programme – Service Based Architecture (SBA) is given top priority. It's transforming the 5G core network allowing network services to be implemented in a flexible manner. SBA will be deployed in cloud native environments to achieve serviceability, elasticity, high availability, multi-tenancy and automation.

The automotive industry and industry automation are key drivers for transforming the RAN (radio access network) architecture. Their requirements on URLLC cannot be delivered by today's



networks. Initial studies from NGMN have highlighted the implications and trade-offs that need to be considered. The next step will provide an end-to-end (e2e) technology view on how to meet the various URLLC requirements and what it means for the network architecture. What is implemented in the 5G standard already is the so-called RAN Functional Split between centralized and distributed units. In addition, 5G will see a new type of RAN Convergence, leveraging the capabilities of technologies in licensed and unlicensed spectrum.

Two major cross-functional objectives are coming with 5G. One is a holistic approach on e2e security including classical network security (3GPP), implementation security (Software and Hardware) and management as well as application/device security. The other one points to Zero Touch Network & Service Automation to handle the complexity of future networks and to reduce the total cost of ownership.

What the concept of Self Organizing Networks promised some years ago will be delivered in future with the support of Artificial Intelligence.

We are looking forward to continuing our close and very successful cooperation with ETSI to jointly deliver the huge potential that 5G offers to the benefit of the mobile ecosystem.

■ Dr. Peter Meissner, CEO NGMN Alliance





*In December, 3GPP celebrated its 20th anniversary in the beautiful town of Sorrento, Italy. For this special occasion, the 3GPP Chairmen made a personal reflection on this success story.*

***“Let's make 5G happen!”***



■ Georg Mayer, CT Chairman, Huawei

Georg Mayer is the Chairman of the Core Network and Terminals Technical Specification Group of 3GPP (TSG CT). He coordinates 5G related work inside and outside 3GPP and works closely with several of the new stakeholders in 5G, such as public safety, railways, autonomous systems and IoT service providers.

***How did you get started with 3GPP?***

I was working with enterprise networks at the time and already involved in standardization. I wanted to move into mobile networks standardization and so I applied, and 3GPP was the natural group to attend. I actually started working on voice over IP related issues (IMS).

***What impressed you the most when you joined 3GPP?***

The sheer size of the meetings and how lively they were compared to my previous experience in standardization. There were so many issues discussed during the same meeting! The magic of it was finding consensus in a room full of competitors. And at the end everybody backed the decision.

***You must have seen a lot over the years, what's your best memory?***

I have many but what comes to my mind is my first meeting in Finland, Oulu in February where it was freezing...After the meeting, some of us seriously hesitated to go to a bar just across the street because of the cold. The good spirit of the group finally gave us the courage to go and enjoy a great evening together.

***If you could turn back the clock, what single thing would you change, if any?***

We could have had more communication with other standardization bodies and other industry organizations, other sectors. We need to better promote ourselves because we do connect the world and need more input from those who use our technologies.

***“Happy Anniversary 3GPP!  
These have been 20 great  
years!”***



■ Erik Guttman, SA Chairman, Samsung

Since graduate school, Erik Guttman has worked mainly in networking and telecommunications standards, leading engineering teams, researching requirements, testing activities and participating in networking research. Since 2007 Erik has participated in 3GPP as a delegate and SA2 Chairman. He is now the Chairman of the System Architecture Technical Specification Group of 3GPP (TSG SA).

***How did you get started with 3GPP?***

While working at Sun Microsystems in Sun Labs in 1998, I was part of a “4G” research effort. I participated in the IETF and SA2 to investigate the use of IP mobility for GPRS. I learnt a lot at that time, and found out that 3GPP is a great organization to work in! I am very happy to have joined Samsung and to have worked as an SA2 delegate since 2007, having a chance to contribute to 4G standardization.

***What impressed you the most when you joined 3GPP?***

I really liked the way that each 3GPP meeting makes concrete progress and involves direct collaboration off-line to forge agreements through revisions. The quality of the engineers involved and the timeliness of the projects also made for exciting work – and still does! I immediately formed friendships that continue to this day.

***You must have seen a lot over the years, what’s your best memory?***

I remember a social event at a SA2 meeting in Brunstad, Norway. Balazs [Bertenyi], then SA2 Chairman, had the spontaneous idea that a few ‘leaders’ throw off their clothes and charge into the harbour. I joined the intrepid few who raced into the chilly water in our underwear while the working group cheered us on. Thanks for the great team spirit activities, Balazs!

***If you could turn back the clock, what single thing would you change, if any?***

What a hard question! In general, I have no regrets! I continued work at the IETF for a few years as chairman of the ZEROCONF working group. In retrospect it would have been nice if I had had the chance to move on and work as a 3GPP delegate full time after 2000, instead.

***“Keep calm and carry on...  
for another 20 years!”***



■ Balazs Bertenyi, RAN Chairman, Nokia

Balazs Bertenyi was elected as the Chairman of the Radio Access Networks Technical Specification Group of 3GPP (TSG-RAN) in 2017. He joined 3GPP standardization in 2000 working in SA2 and SA. He then moved to RAN working on 5G.

***How did you get started with 3GPP?***

As everybody else, I was asked to cover only one meeting in SA2 on IMS, that was 18 years ago and counting. The most intriguing element of the 3GPP world is the fact that you always work on the latest technologies and with some of the best minds of industry.

***What impressed you the most when you joined 3GPP?***

The breadth and the depth of some of the senior delegates was really fascinating, I got to learn a lot very quickly. Although you have several hundreds of people in the meeting room, 3GPP still makes steady progress thanks to an efficient working culture.

***You must have seen a lot over the years, what’s your best memory?***

I remember a great ski trip we made several years ago in Innsbruck in conjunction with the SA2 meeting there. It was great fun and the fact that you connect to people on a personal level builds trust and personal relationships across the aisle and that makes standard’s work a truly unique experience.

***If you could turn back the clock, what single thing would you change, if any?***

There are always small regrets about things you could have done differently or better to get a more optimal decision, but at the end of the day I wouldn’t really change anything. You learn from your mistakes and accept the fact that others will make mistakes too. We’re all human...

# 5G Phase 2 in sight



***Intense standardization activity has begun to support various business sectors requiring new capabilities and features from 3GPP networks.***



Like every generation before it, the 3GPP 5G system embraces state-of-the-art platforms and technologies. One of the major advances will be for 5G networks to take advantage of virtualization and software-ization, which transform the way of deploying and operating networks – moving from dedicated servers into executing processes for design, implementation, testing, orchestration, operation and maintenance.

Defining network functions as software further opens the way for sharing processes and resources with other software platforms or applications, reducing the amount of platforms and network entities to maintain and operate separately as well as providing better economies of scale.

The 5G standards provide the starting point of this transformation with the adoption of a service-based architecture for 5G. The first Release of 5G already defines all network functions as offering their services via standardized interfaces.

These are part of a common framework, in which the network functions may operate flexibly, efficiently and openly in virtualized environments.

This first 5G release also defines how 3GPP will facilitate network slicing. This capability transforms an operator's single one-size-fits-all network that served all customers and usage scenarios into what becomes a set of distinct networks termed "slices". Each network slice operates independently, tailored to serve specific customers and usage scenarios, with its own resources.

Network slicing enables another transformation: that of the business processes. Previously, extra features and controls were needed to manage different business customers' services individually within a single common network, for example by grouping a customer's devices using a dedicated Access Point Names (APN) and control network load per APN. In 5G, every network slice forms a complete network, has its own

resources and controls and is therefore ideally customizable to an individual business customer's contracted network capabilities and features. This transforms the possibilities of B2B services. The prevailing end customer business shifts to diverse business customers.

Slice specific Operations and Maintenance (O&M) provides extensive facilities for orchestration, operating and managing slices individually in the virtual environment. Specifically intended for B2B, these O&M capabilities may be exposed to business customers to allow them to monitor the fulfilment of their Service Level Agreements or to manage their contracted slices.

3GPP's second 5G release, scheduled for its functional freeze by the end of 2019, will further enhance many network aspects, including the service-based architecture. It will add control and user plane optimizations and expand on nearly all the functionality developed for the 4G system.

The most significant advance will be features and services to satisfy the needs of new business customers and new usage scenarios, such as non-public networks, low latency and ultra-reliable communication. Another important advance is support for fixed networking as a 3GPP access. The 5G system will increasingly support network automation – an ever more relevant capability – as more complex, dynamic and tailored networks and slices appear.

■ Frank Mademann, 3GPP SA2 Chairman





# oneM2M-based applications

## showcased at ETSI's IoT week

***Once again the ETSI's IoT week proved to be a success. It was the place for the industry to demonstrate some of the latest IoT deployments and use cases, showing how interoperability is helping accelerate the market.***

Among the demonstrations, significant developments were shown, including Spirent's first TTA-certified complete test system/solution for oneM2M device and platform testing, which empowers testers to fully automate the whole process. F-Interop, a European research project for IoT online testing, also focused on demonstrating how the oneM2M test tool provides automated interoperability tests.

A wide variety of markets were addressed by the demos, emphasizing the large impact the IoT is likely to have. Orange Labs focused on the Multi Access Control Management Using Dynamic Authorization System, highlighting the complexities that exist between IoT business cases and the collaboration needed by different actors to be able to build and run an IoT infrastructure.

It showed how the oneM2M specification, TR-0019 (Dynamic Authorization), manages Access Control on different IoT resources in a unified way. OCEAN, one of the member-driven oneM2M open source projects, was presented by KETI, exhibiting oneM2M APIs in service implementations in different domains and how the oneM2M standard can be used for machine learning services.

Another concept demonstrated by Institut Mines-Telecom - Telecom Sud Paris was the oneM2M-based ETSI SmartBAN Specifications and Standards-Based IoT Platform for Elderly at Home Monitoring and Support. This presented an integrated global IoT/oneM2M platform with data/device/network/semantic interoperability management and embedded semantic analytics dedicated for Smart BANs (Body Area Networks) and their application domains.

Moving underwater, Easy Global Market, Intrasoft, and WINGS presented the IMPAQT H2020 project which develops and validates in-situ a multi-purpose, multi-sensing and multi-functional management platform for sustainable Integrated Multi-Trophic Aquaculture (IMTA) production.

IMTA is a sustainable aquaculture process where several species are grown in the same area and each species benefits from the waste of the other. To manage and monitor this complex equilibrium, many parameters, including external sources, need collecting from sensors. The project uses a oneM2M-based data aggregator in charge of managing sensor heterogeneity to provide device management and data streaming.

Interdigital also joined the line-up, showcasing its market-proven oneM2M-based oneTRANSPORT initiative, while ATOS, LAAS-CNRS, M3 Systems and eDevice simulated a smart city ecosystem.

Meanwhile, Sensinov, Nextworks and UNIZG brought IoT home, showcasing an interworking scenario between oneM2M and a commercial, proprietary IoT platform in the Smart Home domain. Last but not least, John Deere and Sensinov presented a smart agriculture and automotive scenario where a oneM2M gateway is used to transmit a warning message from farm equipment entering the road to passing vehicles.

■ Patrick Van de Wille, Chair of Marcom at oneM2M



# Standards and European regulation

## to make Europe the global cybersecurity leader

*Europe has driven the standardization process for more than 100 years and offers the European and international industry a collaborative way to work towards creating high-quality standards. Today the Cybersecurity Act is a real opportunity for Europe to come back on stage.*

With the adoption of the Product Liability directive in 1985, the need for European standards and their conformity assessment became critical. It is a recognized fact that product safety requirements have increased the quality of our European products to the benefit of citizens.

Since 1995, Europe as a leader in digital security has deployed encryption



for Europe to stay ahead in the areas of encryption, data privacy, biometry and tamper-resistance. Hardware and software tamper-resistance is a de facto European “know-how” and we can be proud of it.

and its cybersecurity certification scheme can be a strategic game changer. But industry needs a different mindset to make the “safety” and “cybersecurity” sectors work together.

With the Cybersecurity Act proposed regulation, there is a huge opportunity for the European industry to go back to the successful “legislation-and-standards” philosophy using the cybersecurity vector. But we need to understand each other.

On one hand, the safety-related standards require static testing which is usually called “conformity assessment” (certification); on the other hand, the cybersecurity standards need dynamic testing and cybersecurity certification. Therefore, we should promote the Cybersecurity Act certification scheme for ICT devices from the beginning of the product’s design and before a connectivity feature is added to the product.

We should work on introducing the Cybersecurity Act Certification Scheme into legislation of such sectors as machinery, toys and cars before they enter the European market.

This said, can Europe win the battle of a secure Internet while respecting its fundamental values? And create global leaders to put European industry back into the race?

Yes, we can, but that involves safety and cybersecurity stakeholders working in the same direction.

■ *Stéfan Mouille, President of Eurosmart*



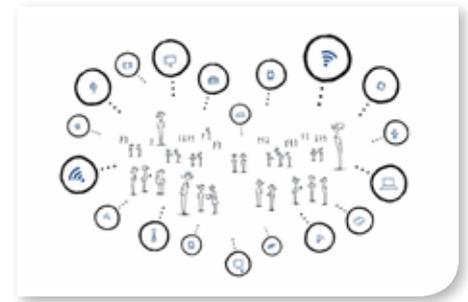
technologies for billions of users, and above all for critical infrastructures such as payment, digital identity, telecommunications and transportation, as well as in the fight against cybercriminals. To achieve this, European and international standards are critical

Nowadays, with the tremendous number of cyberattacks, the paradigm is once again changing. The European Cybersecurity Act and its cybersecurity certification framework is a unique occasion for all. Embracing the European Cybersecurity Act regulation

## New video: **Design Tomorrow's World with the Standards People**

ETSI is pleased to present the second video of its series that aims at educating a wider audience on the importance of standardization.

That said, why have over 850 large and small companies, administrations and research entities, and academic institutions from all over the world chosen to join the ETSI community? Because they know that being an active player in the standards-making process will make a difference. Watch our video on our Youtube channel and understand all the benefits of joining the Standards People!



## New article in Springer: **to promote 5G standardization with ETSI**

This article, bylined by ETSI's Director General, was published in *Elektrotechnik und Informationstechnik*, Volume 135, Issue 7, by Springer®.

The article details the ETSI approach of creating building blocks for 5G systems. ETSI's work on network functions virtualization, edge computing and automation are examples of how ETSI is acting as an incubator and an accelerator of key 5G solutions.

It also reports on how the 3GPP Radio group settled on a new 5G radio interface and how a Service Based Architecture and Network Slicing are being addressed. The article concludes with a look at how the 'Internet of things' has impacted ETSI. Read more here: <https://rdcu.be/8P0l>



## New membership flyer

Now available!

Why should you join ETSI? For the impact, for networking and for awareness and education: these are some of the key benefits highlighted in our new membership flyer.

You can also find out more about our diverse pool of members comprising large and small private companies, research entities, academic institutions, and government and public organizations who wish to participate in setting the agenda when it comes to evolving technologies.

Membership requires an annual contribution, determined by the size and nature of the member company or organization.

Our working methods are designed to minimize costs and maximize effectiveness.

## Our series of **cybersecurity webinars**

To coincide with European Cyber Security Month, ETSI's most security-focused Technical Committee, TC CYBER, hosted a series of weekly webinars throughout October.

Presented by leading specialists within ETSI's security groups, the webinars addressed key topics including the Middlebox Security Protocol, Attribute-Based Encryption, and Quantum-Safe Cryptography and provided an overview of the current status of standardization work within TC CYBER.

The ETSI committee is recognized worldwide as a major trusted centre of expertise offering market-driven cybersecurity standardization solutions, advice and guidance to users, manufacturers, network infrastructure and service operators, and regulators. They are all available for free on the ETSI website in the "events" section.





# Interview

## Dr Neviana Nikoloski, new Chairman of ETSI's General Assembly

Neviana Nikoloski is the Manager of Regulatory Affairs and IPR at Phonak Communications AG, Switzerland. She earned a Doctor of Science degree from the Swiss Federal Institute of Technology (ETH), Zurich, Switzerland and holds a Master's degree in Engineering Physics from the State University "St. Kliment Ohridski" in Sofia, Bulgaria. Neviana speaks Bulgarian, her mother tongue, English, French, German and Russian.

***During our last General Assembly in November, ETSI members elected Dr Nikoloski as the new Chairman of ETSI's GA. After this nomination, Neviana shared her thoughts and feelings with us.***

***Neviana, what were your first thoughts and feelings when you heard about your election?***

After seeing the results, I had an explosion of all types of emotions! And at the same time, I felt very proud to be part of ETSI, where equality, diversity and inclusiveness are part of our organizational culture. I was also very grateful to Howard [Benn, Samsung representative and contender to the GA chairmanship] for the collegial competition and to all members for believing in me by electing me to this position.

***What are your key strengths, do you think, to be selected for this position?***

Over the last 10 years I have participated in several technical committees and since 2011, I have been a member of the ETSI Board and Head of the Swiss National Delegation. In my view, the ability to remain neutral and look for consensus when I chair meetings, as well as my extensive experience and expertise in the regulatory area within CEPT and in standards development for European and International Standardization organizations, have played a decisive role in this election.

***As a member of the board, what would you consider as your key achievements?***

I actively contributed to the review of the ETSI rules of procedure as a result of the revision of the EN Approval Process. I also worked hard on inclusiveness topics to ensure that SMEs' and societal stakeholders' interests were considered.

***How do you see your new role as ETSI's GA Chairman?***

With my working style, I think I bring the typical Swiss values of neutrality, openness, fairness, transparency, inclusiveness and tolerance. My goal is to play an active role in cooperation with users, operators, manufacturers, administrations and other relevant stakeholders to strengthen ETSI's position as a leading standardization organization producing globally applicable ICT standards.

# The Centre for Testing and Interoperability

## Boosting ETSI's technical excellence

*Technical excellence lies at the heart of ETSI and is central to its members' aspirations. Products and standards evolve in parallel, requiring feedback in both directions.*

Pre-standardization activities, validation of standards and testing are a first-rate means for generating this feedback. They complement the creation of high-quality standards, enabling industry to produce innovative, interoperable and cost-effective products and services.

ETSI's Centre for Testing and Interoperability (CTI) supports our standardization groups in the use of best practices for the specification and validation of standards, the development of conformance and interoperability test specifications, and the organization of interoperability and developer events. Furthermore, we oversee early standardization Proofs of Concept and

coordinate open software development related to the standards, including open APIs. ETSI Plugtests™ interoperability events enable companies to interconnect standards-based equipment ranging from prototypes to production implementations to test for interoperability and, where needed, conformance to requirements.

The events provide a highly cost-effective and practical way of identifying inconsistencies in either an implementation or the standard itself. In order to encourage wide participation, we have developed capabilities for remote access to these activities which we are now extending to a cloud-based testing platform.



Technologies that CTI currently covers include 5G mobile, safety and mission critical communications, intelligent transport, electronic signature, network virtualization and the Internet of Things but will evolve with the needs of ETSI membership

■ Anthony Wiles, ETSI's CTI Director

# New voting tool for 3GPP

## From paper to digital



*Since its first publication in January 2015, the 3GPP portal – codenamed 3GU – has been in constant evolution to enhance its stability and ease of use, improve quality of data and provide new features that help both 3GPP delegates and group secretaries to contribute more effectively.*

We have recently published a set of new features. These include parsing of uploaded Change Requests to ensure that metadata are correct and a more detailed Change Requests portlet that now offers a detailed view for each Change Request. We've also added a reworked detailed view for Specifications with more direct access to information and several fixes to improve quality of data. In parallel, another very challenging

project has started: we are currently building an online voting tool for 3GPP. This new portal-based application will replace the current paper-based process, thus optimizing the time needed to vote for 3GPP delegates and drastically reducing the administrative work. This new application will cover all aspects of elections and technical votes, be it creation and administration of the votes, declaration and management of proxies

and candidatures, in-person and proxy voting or dissemination and display of vote results. To achieve fully satisfactory results, we have sought expertise in the user interface domain, as well as in the testing domain, both considered critical for this project. The timeframe for implementation is tight but our goal is to have a first version ready for TSG elections in March 2019.

■ Mathieu Mangion, ETSI's IT Project Manager

# Hear from us in conferences and meet with us at exhibitions.

Find more information and register on our website at: [www.etsi.org/news-events](http://www.etsi.org/news-events)

## January 2019



### First mWT Plugtests™ event 21-24 Jan., ETSI, Sophia Antipolis, FR

This edition of the Plugtests event will focus on proving the ability of Software Defined Networks (SDN) to operate from an end-to-end service point of view. This is the first event focusing on the advantages of using a standard Northbound Interface (NBI).



### European 5G Conference 22-23 Jan., Brussels, BE

Endorsed by ETSI, the 3rd Annual European 5G Conference offers a full 2 days of discussions and debate involving more than 40 top-level speakers. ETSI's CTO, Adrian Scrase, will be a speaker.



### NG112 Emergency Communications Plugtests™ event 28 Jan.-1 Feb., ETSI, Sophia Antipolis, FR

This event, in cooperation with the European Emergency Number Association (EENA) is a unique chance for vendors of emergency communication equipment to test their product against different implementations and scenarios.

## February 2019



### 5th OSM Hackfest 4-8 Feb., Barcelona, ES

This OSM Hackfest, hosted by the Centre Tecnològic de Telecomunicacions de Catalunya, will allow OSM users to become familiar with Open Source MANO Release FIVE with a focus on VNF packaging, on-boarding, operation and monitoring.



### Remote NFV API Plugtests™ event Remote, 4 Feb.-29 March

Within the NFV Plugtests Programme, comprising a diverse community, and supporting open source communities, this event offers a unique opportunity to validate the implementation of NFV SOL APIs. The individual test sessions will be run remotely with the support of dedicated experts.



### ITS Cooperative Mobility Services Event 25 Feb.-1 March, ETSI, Sophia Antipolis, FR

This event will focus on testing Intelligent Transport Systems (ITS) security features in order to support industry in the C-ITS deployment. Interoperability and conformance testing sessions will be offered to the participants.

## March 2019



### ETSI Workshop on Intelligent Transport Systems (ITS) *4-6 March, ETSI, Sophia Antipolis, FR*

This workshop will give you an overview status of ITS ongoing activities to facilitate the deployment of Cooperative ITS (C-ITS) around the globe.



### TCCA's Critical Communications Europe *12-13 March, Coventry, UK*

TCCA's Critical Communications Europe (CC) event will take place in conjunction with the BAPCO Annual Conference and Exhibition, at the Ricoh Arena. Both events will provide an opportunity for all those involved in the sector to come together in the UK to network, learn and discuss everything to do with critical communications and public safety solutions.



### 5G Briefing *26-27 March, Frankfurt, DE*

ETSI is pleased to endorse the second edition of the 5G Briefing. Interactive presentation sessions and panel discussions will offer thought-leading insights and analysis on business opportunities, to provide an understanding of what the future of mobile networks will look like and discuss the 5G mobile network.



### Zero Touch & Carrier Automation Summit *26-28 March, Madrid, ES*

ETSI is endorsing Layer123's Zero Touch and Carrier Automation Summit and participants will have the opportunity to hear about the latest development in our technical groups, including Zero touch and Service Management and Open Source MANO.



### FutureNet World 2019 *26-28 March, Madrid, ES*

Endorsed by ETSI, this two-day event offers unique insight into how operators must evolve their networks and apply intelligence and the use of AI to take advantage of the next wave of business opportunities and future proof their business. ETSI members receive a 25% discount.

## April-May 2019

### ETSI Summit on Artificial Intelligence *4 April, ETSI, Sophia Antipolis, FR*

This summit will give you an insight on opportunities, challenges and risks of AI applications in the industry and in society. Find out more on our website!



### Telco-blockchain-forum *8-9 May, London, UK*

Endorsed by ETSI, Telco Blockchain Forum will bring you the latest content and use cases to help you structure your blockchain strategy and further the debate on blockchain in telecommunications.

**870**  
members

**2652**  
standards



# ETSI SNAPSHOT

2018

**26%**  
SMEs

**727**  
standards  
under development

**60**  
technical groups

**15.5**  
million  
standards'  
downloads

**574**  
meetings

**5893**  
participants  
**29 204**  
eParticipants



**3516**  
eMeetings

**108**  
partnerships

**51**  
conferences  
& Plugtests

@ETSI  
Secretariat

**122**  
people

**15**  
nationalities

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**66**  
countries

## About ETSI

ETSI provides members with an open and inclusive environment to support the timely development, ratification and testing of globally applicable standards for ICT-enabled systems, applications and services across all sectors of industry and society. We are a not-for-profit body with more than 800 member organizations worldwide, drawn from 66 countries and five continents. Members comprise a diversified pool of large and small private companies, research entities, academia, government and public organizations.

ETSI is one of only three bodies officially recognized by the EU as a European Standards Organization (ESO).  
For more information please visit: [www.etsi.org](http://www.etsi.org)

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