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MADE IN EUROPE FOR GLOBAL USE

Power Set to be Key Battleground for 5G

By Mauro Boldi, ETSI, and Xiaobao Chen, 3GPP

Although energy efficiency was important in previous generations of mobile communications standards, such as UMTS and LTE, far greater emphasis will be placed upon this as a key performance metric in the forthcoming 5G standard. With each new generation of mobile communication technology, the energy consumed by the network has grown significantly, as the number of subscribers and the level of carried data traffic have both continued to rise, despite the consumption of the equipment being utilized actually decreasing slightly. If this dynamic was to continue then migration to 5G would be difficult from both an economic and an ecological standpoint. Consequently, energy efficiency will be one of the highest priorities for the 5G era.

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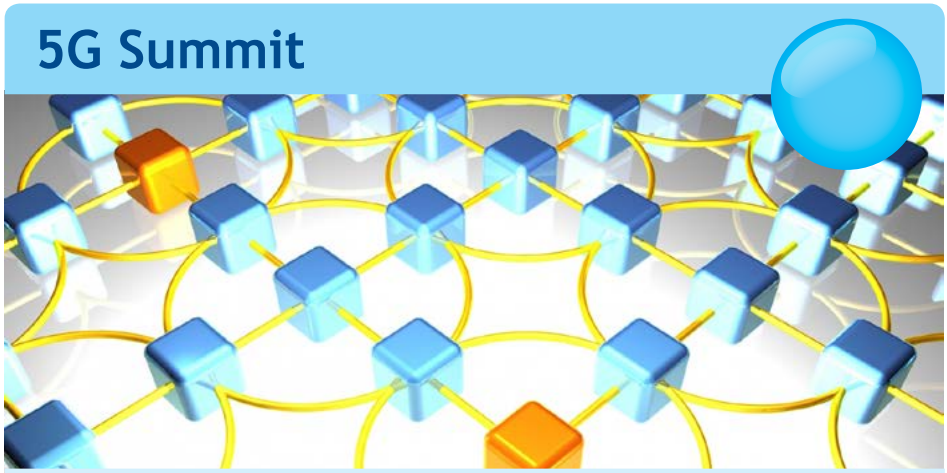
5G Summit



Join us at the ETSI Summit on 5G Network Infrastructure!
6 April 2017 in ETSI, Sophia Antipolis, France

Discover the technology solutions needed to enable true scalable mobility and fulfil the ambitious 5G requirements in terms of performance, reliability, energy efficiency and security.

For more details, go to: https://goo.gl/7tWSn0

And follow us at: #ETSI5Gsummit

A New Logo for 5G Specifications

We have approved a new logo to be used on 3GPP 5G specifications from Release 15 onwards. The logo has a new wave pattern, but is a development of the existing LTE waves, using the green of the LTE-Advanced Pro version. The idea is to keep a familiar design aspect with the use of plain black text and textured waves, but to make the logo stronger and sharper - ready for use on the new radio and next generation core specifications for 5G.

The use of the 5G logo on 3GPP specification cover sheets is intended to help the industry to identify at which point in time 5G features will appear. It will be used on the relevant 5G Phase 1 specifications in Release 15 (Complete by late 2018) and then the 5G Phase 2, Release 16 specifications - for completion in 2020. It will also be used for releases beyond, as it is probable that 5G will span a series of releases, as was the case with LTE, which started with Release 8 - continuing beyond Release 14.

For companies and partners wishing to use the 5G logo, a usage guide and logo policy is available on line at: https://goo.gl/JReTgX

Welcome to the World of Standards

Welcome to the February 2017 edition of The Standard. 5G dominates the technology headlines and will remain an important topic for ETSI and 3GPP in the coming years. You can read about our upcoming ETSI Summit on 5G network infrastructure. We also look at energy efficiency for 5G systems, and 3GPP have issued a new 5G logo.

In this issue we cover some of ETSI's more advanced standardization subjects. We take a closer look at our work on Quantum Key Distribution and Quantum Safe Cryptography. ETSI is leading the world in standardization on these subjects. You will see that there is a real and immediate need for our work. We look at two new Industry Specification Groups, on Context Information Management and on Experiential Network Intelligence. We hear about progress from our Open Source MANO group and we get an insight into the industrial importance of our oneM2M partnership project. We also have an interesting article from a representative of an SME active in ETSI standardization. I invite other SMEs to take advantage of this platform to tell us of their experience in ETSI, and as a result make themselves more widely known.

Once again, I hope you enjoy this edition.

Luis Jorge Romero,
Director General, ETSI

Power Set to be Key Battleground for 5G

Continued (from page 1)

Next generation networks will be expected to support dramatically higher user experienced data rates – up to 1 Gbps in some specific areas, such as indoor hotspots, and 50 Mbps for everywhere under 5G coverage – and a far larger number of connected devices. Some estimates expect up to 50 billion in total, though most agree it will take several years before this level is reached. The volume of traffic will grow as a wider array of applications emerge that are reliant on elevated data rates and the content that users want to transfer over the network keeps expanding. Increased use of video streaming, plus new services such as those based on augmented reality, will contribute heavily to this. Further down the line, industrial, automotive and medical applications are certain to ramp up the data overheads still higher.

Data growth and energy use

Among the fundamental objectives that have been defined for the 5G standard is for the network's data capacity to go up 1,000 fold during the course of the next decade. The intention is to simultaneously achieve a 50% reduction in the global network's total energy usage, including that of existing legacy technologies. For this to happen, clearly the overall energy efficiency of the network has to improve substantially.

Reducing the ongoing operational expenses of the network and environmental footprint, such as CO2 emissions, will be among the main motivations spurring operators to move to 5G, and power consumption is a key area where cost savings need to be witnessed. As well as the benefits experienced by the operator, there is a need to improve the user experience too. The goal here will be to allow smartphones to connect to the network while managing to run for much longer periods between recharges - thereby offering greater convenience for mobile subscribers.

Multiple use cases

One element that makes 5G quite different from previous mobile generations is that its operational characteristics will need to satisfy a plethora of different, often quite unrelated, demands. This time it is not simply about raising the data capacity (though that will be important of course) but also about supporting new communication use cases.

The emergence of the Internet of Things (IoT), in particular, will have major implications, with many IoT deployments having their own distinct set of requirements. Remote sensor nodes, responsible for monitoring a certain parameter in smart cities for example, or industrial M2M terminals, may need the massive connectivity that 5G affords, but a high data rate will not be of great value in this context. One of the most significant factors here will be keeping the power consumption to an absolute minimum. These sensor nodes will only be operational for a very small proportion of the time and the data they need to transmit will be very modest. 5G must be able to accommodate the minimal throughput and irregular connectivity that characterises this type of use case, while operating within the power constraints of sensor nodes whose batteries must last up to 15 years.

Mauro Boldi is vice-chairman of the EEPS (Eco Environmental Product Standards) group in the Environmental Engineering Technical Committee

Xiabao Chen is the rapporteur of 3GPP SA

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Power Set to be Key Battleground for 5G Continued (from page 2)

New Network Structures

The way that 5G networks are constructed will be essentially different from the approach of previous generations. These new networks will rely much more on the deployment of pico, femto or moving cells, which will effectively mean that the user is brought a lot closer to the point of transmission and the power needed to transmit the signal will consequently be lowered. Utilization of the Cloud is also expected to be of great importance. Virtualization of network functions promises to deliver both increased flexibility and efficiency. This will mean that rather than transmission being the dominant component of overall power consumption, there will be a shift to the more manageable computational power dimension (though this will also present the industry with certain challenges).

The implementation of massive MIMO (multiple-input, multiple-output) transmission techniques will also prove to be advantageous - compensating path loss and enabling stronger signals while consuming less energy. This, along with adaptive beamforming, could help to counter the limited range of mm wavelength transmission (which will begin to be employed to boost data rates). Having enhanced the power performance of the underlying network technology, there will subsequently be an opportunity to make greater use of alternative energy sources, such as photovoltaics, to supplement the conventional power supply.

One of the most significant factors here will be keeping the power consumption to an absolute minimum.

5G needs to furnish operators with a business model that is sustainable in terms of the financial investment required and the day-to-day running costs, as well as in relation to its long term effect on the environment - so that international legislative guidelines can be met. The technical obstacles that operators face in respect to power efficiency will be challenging but are not insurmountable. Improved energy efficiency needs to be a consideration of each constituent part of the proposed network technology, covering everything from how the system architecture is implemented right through to facets of functional design. This will allow operators to obtain the system-wide energy savings they need.

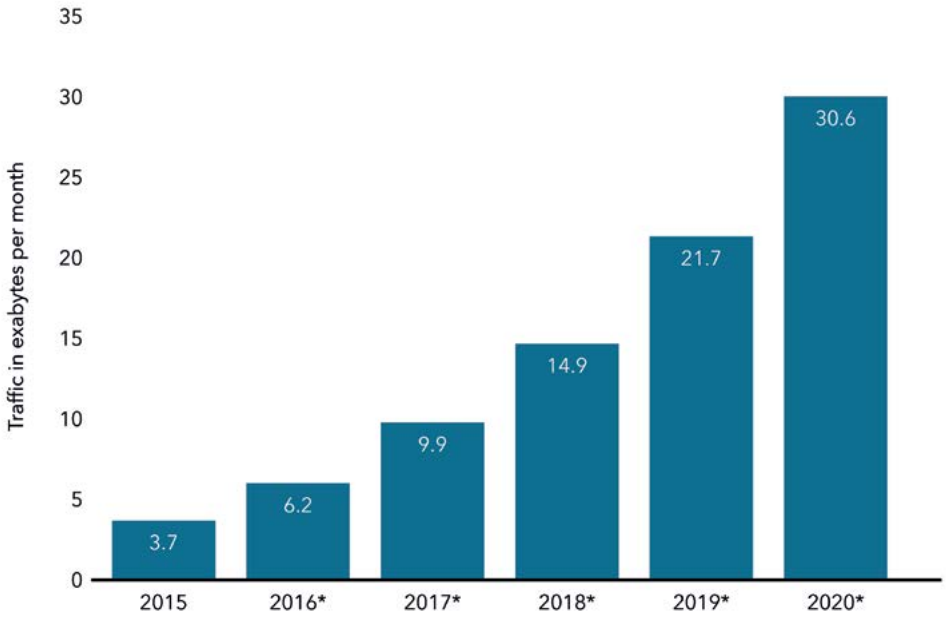
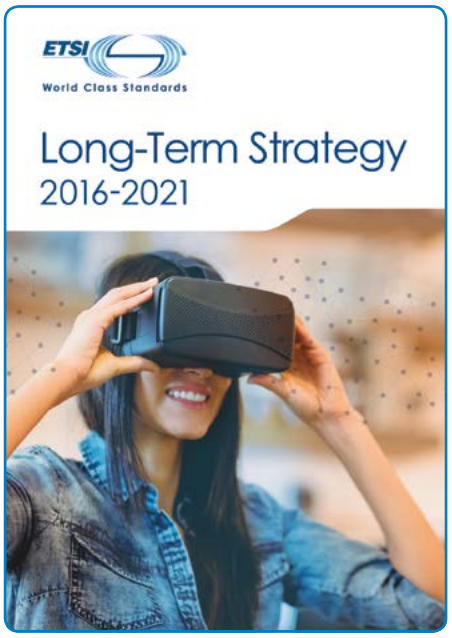


Figure 1: Global Mobile Traffic in Exabytes/Month [Source: Cisco]

As an organization working to define global standards that enable more productive and environmentally sustainable technology developments, ETSI is focussing closely on energy efficiency within the next generation communication networks. ETSI has recently embarked on an investigation into possible new metrics for energy efficiency within 5G systems. The results are due to be published in a Technical Report towards the end of 2017. Meanwhile, 3GPP has been actively involved in a study of energy efficiency of mobile networks taking in the implications of various deployment scenarios, operating conditions and coordinated energy saving between different parts of the network. ETSI and 3GPP are also heavily engaged in determining the exact system architecture and functional requirements of the 5G standard and methods of monitoring and controlling power consumption will be at the heart of this.

First published by European Energy Innovation, December 2016

https://goo.gl/YBK24M



New Brochure: ETSI Long Term Strategy 2016-2021

Our Long Term Strategy is developed by our members. It defines our Vision, our Mission and nine basic principles which constitute our core. It also outlines our five strategic objectives

- Being at the Heart of Digital
- Being an Enabler of Standards
- Being Global
- Being Versatile
- Being Inclusive

https://goo.gl/7AwocX

Year 1: OSM Races out of the Starting Gates to Shape Global Mano Ecosystem

Written by Chris Buerger, Intel, Chair of OSM Marcom Task Force

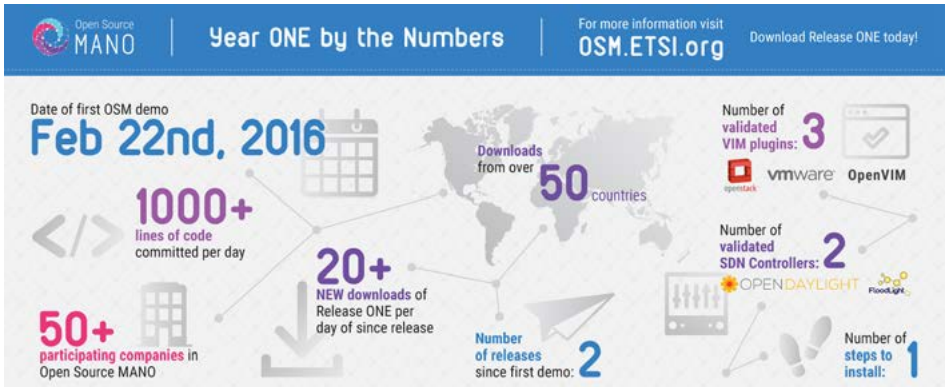
Speed matters. In software development, no matter whether it is proprietary or open source, early success is often defined in the same way as an Olympic 100-meter dash. The first few steps out of the starting block are critical in quickly getting to the 100m point. The race then changes once this has been accomplished – the straight line race track starts to curve and a group of runners settles in to run the distance and find success at the finish line.

To me, the first year of OSM bears a number of similarities to a 100-meter race, and as the year 2017 has just started, I am taking some time to reflect on what we have jointly accomplished since the inception of the OSM community and outline a number of personal thoughts on key themes for this new year.

OSM releases have been downloaded more than 2000 times from 50+ countries, 55 organizations have joined OSM, we have much to be proud of

Not to wax nostalgic, but looking back at 2016 does showcase a number of accomplishments that would be the envy of the majority of open source communities. From the first public OSM demonstration at the end of February at MWC 2016, to creating two OSM releases that have been downloaded more than 2000 times from 50+ countries, to capturing the interest of 55 organizations that have joined OSM, we have much to be proud of. On the technical side, the creation of a well-functioning, one-step installable, multi-VIM, multi-SDN controller OSM Release ONE that incorporates information models commonly agreed upon by a group of operators and solution vendors stands out to me. On the community engagement side, the OSM workshop at SDN World Congress in The Hague, the launch of the new website, quarterly newsletters, the OSM Twitter channel and, personally most important, the contributions of an awesome group of marketing professionals to create awareness and excitement for OSM top my list.

Speed still matters, but it will be accompanied by well-measured collaboration activities



Year 2 will be different. Speed still matters, but it will be accompanied by well-measured collaboration activities to take the OSM software stack through the standard lab/field/production deployment cycle with service providers engaging in MANO. Interoperability, stability, security and the size and maturity of the commercial support ecosystem for OSM will become key themes on the road to production deployments. New use cases and network service scenarios from the broader community will tie the code base to its economic value. I expect that OSM's guiding principle of modularity for any software component will provide additional choice and capabilities.

In addition, as a result of the success of broadly observed initiatives such as Telefonica's UNICA program, a set of existing and new community members will choose to actively invest time and contribute engineering expertise and code as purchase points for OSM proliferate across the globe. ETSI's groups for NFV and MANO will receive an increasing amount of input based on the pragmatic results of the work within OSM.

OSM turns its sights from a 100-meter dash to a 10k race in 2017

So speed and timing will still matter as OSM turns its sights from a 100-meter dash to a 10k race in 2017. I believe that as with other successful software development initiatives, collaborative and reliable execution and a singular focus on unlocking OSM's economic value for the entire community over the next 5-10 years will set us apart. OSM's accomplishment in getting out of the starting block with speed and clear direction is the best indicator for continued success in 2017 and beyond.

ETSI Open Source MANO Release ONE Now Available

Delivering Superior Interoperability, Modelling and Installation Experience

Open Source MANO

ETSI's Open Source MANO (OSM) group announced on 4 October 2016 the availability of its OSM Release ONE, an open source Management and Orchestration (MANO) software stack closely aligned with ETSI NFV, and focused on helping industry accelerate the implementation of network virtualization. The OSM community aims to deliver a production-quality open source MANO stack that meets the requirements of commercial NFV networks.

Available less than six months since the inaugural meeting of the OSM community, Release ONE has been engineered, tested and documented to allow for rapid installation in operator labs worldwide that seek to create a scalable and interoperable open source MANO environment. Release ONE substantially enhances interoperability with other components (VNFs, VIMs, SDN controllers) and creates a plugin framework to make platform maintenance and extensions significantly easier to provide and support.

In addition, Release ONE improves administrator and developer experience, both in terms of usability and installation procedure as well as enhances modelling of VNFs and network services. In line with the goals of the OSM open source project, the output of this modelling work will be contributed to ETSI NFV. Release ONE also provides extremely flexible virtualized network functions (VNF) configuration and advanced networking management as well as improved troubleshooting capabilities, with advanced logging.

"It's a delight to see such a large number and diversity of contributors", says Andy Reid, ETSI OSM vice chairman and Chief Researcher, Network Services, BT. *"ETSI OSM is unique as it is an operators led group and has spent the early months working on cutting code, having great freedom to progress technical work".*

"Communications Service Providers are embracing NFV to drive transformational change to their businesses," said Gabriele Di Piazza, vice president of solutions, Telco NFV Group at VMware. *"Open frameworks such as OSM will help accelerate this transformation by providing an open standards-based approach to NFV that can lead to improving the velocity of service innovation and reliability."*

Highlights of the list of technical features in Release ONE include:

- Natively supported VIMs: VMware™, OpenStack and OpenVIM
- Support for reference SDN Controllers, such as OpenDayLight (ODL) and FloodLight
- A plugin model to facilitate the addition of new types of VIMs and SDN Controllers, thus minimizing developer effort
- Multi-site Network Services, to respond to operator requirements, allowing deployments that span across multiple datacenters
- A one-step installer, based on containers and Juju modelling, to simplify testing, customization and deployment of OSM
- Extended virtualized network functions (VNF) and network service models, allowing Day-Zero VNF configuration
- OpenVIM code, included as part of the OSM install, providing a reference VIM for all-in-one installations with full support of Enhanced Platform Awareness. Uniquely, users are not required to have a pre-existing VIM installation in their premises before installing OSM.

"The pace of the group's work has been amazing, and as one of the fastest growing NFV and SDN open source projects, OSM now proudly counts 46 members including many of the leading global operators" says Francisco-Javier Ramón, ETSI OSM Chair and Head of Network Virtualization Initiative at Telefónica, Global CTO.

In order to ensure that OSM inter-operates successfully with multiple types of VIMs and NFV Infrastructures, the OSM group is building a unique network of remote labs offering different combinations of NFV Infrastructure and VIMs, connected over a virtual network. Thus, OSM instances running at ETSI can interact with the remote labs, enabling integration and inter-operability testing with all the VIMs and NFV Infrastructures available.

MPLS+SDN+NFV World Congress

21-24 March 2017, Paris, France

ETSI is pleased to endorse the 19th Edition of the MPLS + SDN + NFV World Congress. The congress will bring together major actors of service provision and enterprise network evolution from 65 countries.

ETSI will organize an ETSI NFV Track and an ETSI MEC Track during the event.

To know more: https://www.uppersideconferences.com/mpls-sdn-nfv/

ETSI Drives NFV Interoperability with First Plugtests Event

ETSI organized the first Network Functions Virtualization (NFV) interoperability Plugtests® event from 23 January to 3 February 2017. This event was hosted by 5TONIC Laboratory with the technical support of Telefonica and took place in Leganes, Madrid, Spain. This important event came hot on the heels of the publication of the ETSI NFV Release 2 specifications and the announcement of ETSI Open Source MANO Release ONE in October 2016.

This first NFV Plugtests event was ambitious. A pre-testing and remote integration phase was already launched in November 2016. 29 remote labs were connected to the ETSI Plugtests network to verify interconnection between the different Virtualized Network Functions (VNFs), Management and Orchestration (MANO) solutions and NFV platforms participating in the Plugtests. During the two-week intense testing phase, interoperability tests focused on validating ETSI NFV Release 2 end-to-end capabilities including management of descriptors and software images, as well as life cycle management of network services and virtual network functions.

The test plan development has been driven by ETSI's Center for Testing and Interoperability, building on the methodology defined by the ETSI NFV testing working group. The overall results and lessons learnt will be fed back to ETSI NFV Industry Specification Group.

Over 40 commercial and open source implementations were tested for interoperability, including 20 virtual network functions, 10 management and orchestration solutions and 10 NFV platforms. Over 140 people have prepared this two week event, forming an engaged and diverse community. Key NFV Open Source projects, ETSI OSM, Open Baton, OPEN-O and OPNFV participated. This first ETSI NFV Plugtests was a unique opportunity to stimulate synergy and alignment across the NFV ecosystem.

The list of participants at this event includes: A10 Networks, ADVA Optical Networking, Anritsu A/S, Canonical USA Inc., Cisco Systems, EANTC, Ericsson, F5 Networks, Fortinet, Fraunhofer FOKUS, Hewlett-Packard Enterprise, Huawei, Intel, Italtel, Ixia, Keynetic Technologies, Lenovo, Mahindra Comviva, Netrounds, Openet, Palo Alto Networks, Radware, Red Hat, RIFT.io, Sandvine, Sonus Networks, Spirent, University of the Basque Country (UPV/EHU), VMware and Wind River.

ETSI Brings Virtualization of Telecommunication Networks Closer with Announcement of NFV Release 2

NFV Architectural Framework Gains Further Traction as Greater Breadth of Key Parameters are Determined

On 27 September 2016 ETSI announced the availability of the NFV Release 2 specifications, delivering requirements, interfaces and information models for Network Functions Virtualization (NFV). This underlines the significant progress made in the development and future utilization of NFV technology. Undertaken by the ETSI Industry Specification Group on NFV (ETSI ISG NFV) now covering an expansive range of core activities, the successful completion of the specifications from the Release 2 roadmap will move the telecommunication sector closer to the goal of a more agile, flexible and cost-effective network infrastructure.

Building on the ETSI ISG NFV documentation that was published in late 2014, NFV Release 2 incorporates 11 new group specifications, in addition to the many NFV specifications already published. These detail the various requirements, interface descriptions and information models enabling interoperability of solutions based on the ETSI NFV Architectural Framework. Release 2 outlines the necessary functional requirements in relation to a wide set of functional areas, such as the management of virtualized resources, lifecycle management of both network services and virtualized network functions, network service fault/performance management, virtualized resource capacity management, etc.

"This represents another major step towards our objective of defining a comprehensive set of specifications that will facilitate the deployment of NFV throughout the telecommunication industry, with significant benefits being subsequently derived in many interrelated sectors," states Telefonica's Diego Lopez, the newly appointed Chairman of ETSI NFV ISG. *"Through the collaborative efforts of all parties involved in the ETSI NFV ISG, we have been able to identify and define the required capabilities, following a practical approach that leverages proofs of concept to explore and demonstrate what was proposed. The combination of wide consensus and experimental evidence has led to NFV being recognized as a completely viable and highly valuable technology. This has allowed us to make progresses at a fast pace."*

> *"ETSI NFV Architectural Framework will be the foundation upon which future virtualization of the network is established"*

"By drawing upon the combined merits of a well-defined standards structure and the support of the open source community, we have been able to accelerate the development process and ensure widespread interoperability," Lopez continues. *"I am therefore confident that the ETSI NFV Architectural Framework will be the foundation upon which future virtualization of the network is established - enabling cost effective allocation of resources and the rapid addition of new services, while still ensuring the highest degrees of security and reliability, as well as painless and seamless integration with existing infrastructure."*

ETSI Launches New Group on Context Information Management for Smart City Interoperability

In January 2017, ETSI has created a new Industry Specification Group on cross-sector Context Information Management (ISG CIM) for smart cities applications and beyond. The first meeting of the ISG CIM has taken place at the ETSI premises in Sophia Antipolis, France, on 9-10 February 2017.

Data without context are meaningless. Every sensor measurement, every entry in a database, every tweet sent and every webcam video watched has its own context. The context seems obvious to humans: the temperature sensor is attached to an air-conditioner in the house, the database of vehicle registration numbers is used by a policeman in the city, the tweet comes from a person who has just witnessed something interesting and the webcam shows a particular city street with its name embedded in the video frames.

Taken away from its context, each piece of information is nearly useless. And software programs/agents searching for useful information may only find it if the context is available i.e. published with the data. A Context Information Management (CIM) system acts as a clearing-house for publishing, discovering, monitoring and maintaining data according to relevant contexts for smart applications.

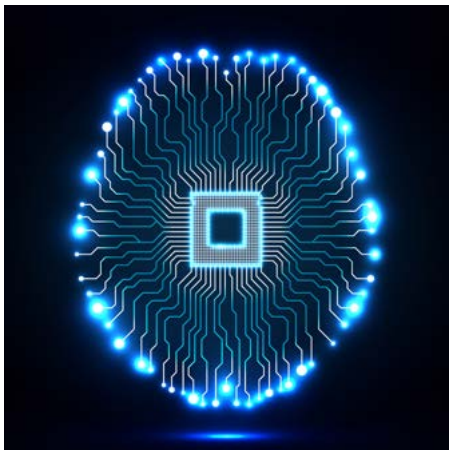
"With the rapid development of technologies such as Big Data, semantic web, complex workflow or autonomous decision making, the need for interoperable context information is becoming huge", said Lindsay Frost, convenor of ETSI ISG CIM *"The ISG CIM will specify protocols running 'on top' of IoT platforms and allowing exchange of data together with its context, this includes what is described by the data, what was measured, when, where, by what, the time of validity, ownership, and others. That will dramatically extend the interoperability of applications, helping smart cities to integrate their existing services and enable new third-party services."*

ISG CIM will focus on developing specifications for a common context information management API, data publication platforms and standard data models. The group will work closely with the ETSI SmartM2M technical committee and with oneM2M, the global standards initiative for M2M and the IoT (Internet of Things) of which ETSI is a founding member, since the IoT is one of the sources of context data for smart applications.

Participation in the cross-sector Context Information Management Industry Specification Group is open to all ETSI members as well as organizations who are not members. For information on how to participate please contact ISGsupport@etsi.org. The full list of members and participants in ISG CIM is available at: https://goo.gl/ARwU9u

"With the rapid development of technologies such as Big Data, semantic web, complex workflow or autonomous decision making, the need for interoperable context information is becoming huge"

New ETSI ISG for Improving Operator Experience using Artificial Intelligence



ETSI is pleased to announce the creation of the Industry Specification Group "Experiential Network Intelligence" (ISG ENI). The purpose of the group is to define a Cognitive Network Management architecture that is based on the "observe-orient-decide-act" control model. It uses AI techniques and context-aware policies to adjust offered services based on changes in user needs, environmental conditions and business goals. The system is experiential, in that it learns from its operation and from decisions given to it by operators to improve its knowledge of how to act in the future. This will help operators automate their network configuration and monitoring processes, thereby reducing their operational expenditure and improving the use and maintenance of their networks.

Operators see human-machine interaction as slow, error-prone, expensive, and cumbersome. Programming different devices and building agile, personalized services makes it increasingly complex to integrate different standardized platforms in their network and operational environment. These human-machine interaction challenges are considered by operators as barriers to reducing the time to market of innovative and advanced services. They also lack an efficient and extensible standards-based mechanism to provide contextually-aware services (e.g., services that adapt to changes in user needs, business goals, or environmental conditions).

The group's work will include the requirements of the operator's experience in and across legacy and virtualized networks including 5G networks and a model-driven architecture that supports adaptive and intelligent service operation through Cognitive Network Management. Different types of policies will be reviewed to drive adaptive behavioral changes using various AI (Artificial Intelligence) mechanisms. Existing mechanisms will be augmented and improved by using the networked intelligence defined by the ENI system.

This new group will drive innovative technologies in network telemetry, big data mechanisms to gather appropriate data at the right speed and scale, and machine learning for intelligent analysis. Innovative policy-based, model-driven functionality will also be needed to simplify and scale complex device configuration and monitoring.

Participation in the Experiential Network Intelligence Industry Specification Group is open to all ETSI members as well as organizations who are not members, subject to signing ISG Agreements. For information on how to participate please contact ISGsupport@etsi.org

Executive Viewpoint Series

Jim Nolan, EVP, InterDigital Solutions

Q. Let's begin with an overview of your role and responsibilities within InterDigital.

JN Let me start off by introducing InterDigital. Our core business is to design and develop advanced technologies for mobile communications. Since the early 1970's, our engineers have designed and developed a wide range of 2G, 3G, 4G and IEEE 802-related products and networks.

I previously ran our in-house R&D unit, InterDigital Labs, for 8 years. Since the middle of 2014, I have run InterDigital Solutions which focuses on bringing our technology to market. We do this by offering specialist R&D services to other companies and by developing commercial technology solutions within InterDigital. We are also active in creating new businesses where we see commercial opportunities to create greater value by joining the capabilities of our technology specialists with external entrepreneurs.

Q. InterDigital has a strong reputation for innovation in the cellular technology arena. How did the company get involved with the IoT?

JN Around 2009, we explored what the next-generation wireless landscape would look like and we identified three tightly coupled possibilities. The first of these applies to new developments in next-generation networks (NGN). Secondly, we felt that the projected growth in digital media would drive content and traffic loads on these networks. And thirdly, we could see that IoT would drive the number of devices on networks. While many of these applications involve small amounts of data traffic, we took the view that all of these connected devices would increase the signalling load on networks quite significantly. It made sense to focus our efforts on these three self-reinforcing areas that would drive the next generation wireless networks.

The IoT, we believe is just the next step in the evolution of the Internet. It's going to require a new set of Internet protocols for 'things'. When we were looking at the next-generation wireless landscape, most of the M2M initiatives focused on proprietary, non-standard approaches within a few verticals. InterDigital decided to take a broader view of the market opportunity. We concentrated our efforts on standards-based solutions and the suite of (horizontal) services necessary to enable multiple IoT applications across multiple verticals. This is the main reason for our involvement in oneM2M.

Q. oneM2M recently issued its Release 2 specifications. How do you view the standard and its progress?

JN Our work in IoT standards started with some early work within ETSI TC M2M group that focused on metering applications. This was a good start but somewhat narrow in scope. Once other worldwide standards organizations joined efforts with ETSI to create oneM2M, we saw the potential for a much more complete standard with the added benefit of global scale and credibility.

The length of time required to create a global harmonized standard does create frustration for many with the standards process. At the same time, we do appreciate that the result from the oneM2M working groups is a very detailed and well-documented specification. I'd say that the progress of oneM2M compares well with the 3GPP standard which was initiated in 1998, saw a first set of products around 2001/2 and mass market traction after about 5 years after its first release. oneM2M, which started in 2013, seems to be progressing along a similar timeline.

Q. Why is the oneM2M standard so important?

JN We see a lot of standards-related activities in the market from different industry alliances and consortia. oneM2M stands out because it takes a truly horizontal approach. It's also applicable across different industry verticals. There is no reason why oneM2M can't be a transparent underlay to many of the other application-specific standards initiatives that have launched in recent years.

You can look at oneM2M as a 'standard of standards'. It re-uses all of the established industry protocols, such as CoAP, MQTT etc. In fact, oneM2M can support IoT applications for multiple access technologies such as Wi-Fi, ZigBee and Bluetooth to create a common IoT platform in smart homes, to illustrate just one example.

Q. How is InterDigital approaching the IoT market and what can we expect to see in the coming year?

JN We are looking in several different areas as part of our IoT commercialization strategy. We have invested in oneMPOWER, our oneM2M-based platform to help businesses to launch and support their IoT applications.

In fact, we are using this platform to support oneTRANSPORT, which is an intelligent transport trial in the UK. Since 2015 we have been working with several local-government authorities, the "Highways England" and several transport-sector specialists to lay the foundation for smarter transport networks in the UK. This is quite a large scale undertaking, covering many different types of connected devices and a population base of about 4 million people. In fact, the project won an award for the best transportation and logistics solution at IoT Solutions World Congress in 2016.

InterDigital also has initiated efforts in the healthcare sector, where we are working as part of the Continua Health Alliance. We are also exploring opportunities in the industrial and enterprise sectors, especially where customers are looking for supplier diversity and therefore need inter-operability capabilities for their IoT applications.

Over the coming years, we expect to support our existing technology licensing customers who are looking for IoT expertise. We will also be offering oneMPOWER as a licensed software solution and possibly as a service through a PaaS model. oneMPOWER is also available in combination with wot.io, a data exchange service that allows companies to take a modular approach for their IoT architecture, so that they can plug in their preferred device management, visualization tool or database, for example, into an overall IoT application.

Continued on page 9 >

Executive Viewpoint Series

Continued (from page 8)

Jim Nolan, EVP, InterDigital Solutions

"We see oneM2M as the broadest standard for the services that enable IoT applications."

Q. What advice would you give to companies that are deploying IoT services and solutions?

JN The IoT is still a nascent market. The ability to spin up a new solution can be quite daunting; there is a lot of effort involved in integrating a complete solution especially if you have to deal with legacy systems. My advice to companies is to look at standards-based solutions where you have an eco-system of multiple solution providers. This gives you multi-vendor interoperability and supplier choice over the long haul.

The oneM2M Executive Viewpoint Series features business insights from senior executives in companies that are commercializing products and services based on the oneM2M standard. For more information, including how to join and participate in oneM2M, see www.onem2m.org.

ETSI IoT-M2M workshop: Approaching a Smarter World

By 2020 each person is expected to have an average of 4 connected devices. Digitization of the world is not a dream, it's already happening for many of us. This new reality lay behind the discussions at the ETSI IoT and M2M workshop, which took place from 15 to 17 November 2016. This event focused on the smart world and especially on smart cities. The workshop was preceded by a half-day session "When Standards Support Policies: the case of IoT and the digitization of industry",

and a one-day tutorial on oneM2M for developers. The workshop also offered the opportunity to view oneM2M showcases: multi-party demonstrations of oneM2M in action, showing commercially available products and currently deployed services covering a cross section of IoT application domains including smart city, smart living, eHealth, smart metering, energy efficiency and home automation, all based upon oneM2M Release 2 specifications.

The European Commission outlined its European urban platform initiatives which address the needs of cities. It highlighted the need for an open common reference architecture for IoT, enabling the integration of the different vertical services present in the city. In addition to oneM2M and ETSI SmartM2M standardization activities, ETSI has also created a working group on sustainable digital multiservice cities. Presentations in the smart city track introduced real life implementations from the city of Bordeaux in France, Murcia in Spain, Greenwich in the UK and several towns in Korea. These cities highlighted the need for technical expertise and advice on the selection and use of standards, in addition to funding to initiate smart cities projects.

Beyond smart cities, several business areas were introduced, including appliances, energy, buildings, transportation, e-health, industry and agriculture. The audience discovered how far ICT was already integrated into some domains with smart appliances and smart farming systems already on the market. The latest developments in oneM2M Release 2 were presented with a particular focus on support for security and semantic interoperability, essential to enable full information sharing among these diverse sectors.

The workshop ended with a panel discussion on the challenges for IoT and M2M standards, following an EC-funded study on the standards landscape and a gap analysis for IoT European Large Scale Pilot (LSP) projects. The discussion concluded that the emergence of IoT ecosystems needs a standardized architecture which offers integration of advanced IoT technologies and interoperability across IoT domains and applications, features which have been developed into oneM2M. The IoT can exist only when information exchange among different solutions and business areas is enabled.

India M2M + iot Forum 2017

4th Edition
india m2m + iot forum
capitalizing connected world
2017
6 – 7 March
India Habitat Centre
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6–7 March 2017, New Delhi, India

ETSI is pleased to endorse the India M2M + iot Forum which aims to highlight India as the 'Manufacturing Hub' for the M2M + iot industry where a wide range of high-quality and high-end engineering products, services and solutions could be sourced by the companies, organizations and governments of the nation and the world.

For more information, visit: http://www.m2m2iotforum.com/

Industrial Standards for Quantum Cryptography

By Andrew Shields, chairman of ETSI ISG QKD

Several networks employing quantum key distribution (QKD) under construction around the world

Global developments

The past year has seen remarkable progress in the deployment of quantum technologies in communication infrastructures, with several networks employing quantum key distribution (QKD) under construction around the world. In the UK, metropolitan quantum networks are being built in Cambridge and Bristol, connected by a long distance backbone link via London. Quantum digital signatures were demonstrated in another metro network in Tokyo. Meanwhile in China a 2000km backbone connecting Beijing and Shanghai is underway and the Micius satellite, launched in August 2016, will extend QKD to global distances.

Europe has a long history of leading research in quantum information science and technology

Europe has a long history of leading research in quantum information science and technology. During 2016 the EC announced a €1bn Flagship initiative to translate this world-leading research into innovative products and services. This is expected to begin with a ramp-up phase in 2018 and will provide stability in funding over a 10 year period. Quantum communications is one of the four "pillars" of the Flagship and is expected to be one of the first quantum technologies to deliver useful applications. Amongst the recommendations of the recently published quantum manifesto for quantum technologies in Europe is a quantum network linking major European cities to promote this innovation. Standards are recognized as essential for industrial and societal take-up of the technology.

Unique advantages of quantum cryptography

Interest in quantum cryptography stems from its unique security properties derived directly from the laws of nature, rather than assumptions about the difficulty of certain mathematical operations. It will allow networks to be more resilient to technological advances in the future. There is a concern that network communications that are encrypted using conventional public key cryptography may be stored today and decrypted in the future when more powerful processors or new methods of crypt-analysis are available. In contrast, quantum cryptographic protocols should be resilient to all advances in computing and mathematics.

The first applications of quantum cryptography are likely to be those requiring long term secrecy

The first applications of quantum cryptography are likely to be those requiring long term secrecy, such as encryption of sensitive government or corporate data or the health records of individuals. Recently Toshiba launched a service to encrypt Genome data sent between a databank and an analysis centre in Sendai, Japan. Meanwhile IdQuantique have announced a service for financial institutions and enterprises to encrypt the data transmitted between the Geneva metropolitan area and a remote disaster recovery data centre located 70 km away.

The threat of quantum computers

Quantum cryptography will also be secure from a quantum computer. Quantum computers can process the inputs of a calculation in parallel and can therefore solve certain numerical problems much more efficiently than a "classical" processor. Following the work of Peter Shor of AT&T, we know that a quantum computer can factorize large integers very efficiently. As the factorization problem is the basis of conventional public key cryptography, this would significantly weaken many of the techniques that we rely on today. As such there is a pressing need to develop cryptography that will remain secure when large scale quantum computers become available.

In 2016, IBM provided the first public access to a simple quantum computer: a circuit they have developed based on superconducting technology. Fortunately, however, your secrets are still safe - for now. This early prototype possesses only 5 quantum bits, so it cannot solve any useful problem faster than an ordinary PC. Nevertheless, scaling to large circuit size is largely now just an engineering problem. With Google, Microsoft and other IT giants investing heavily in this technology, many believe the era of really useful quantum computers may be less than a decade away. Given that it takes many years to introduce new cryptographic infrastructures, it is essential that the technology and associated standards for quantum cryptography are developed now.

The solution to these new threats is likely to involve a combination of both quantum cryptography and new "quantum-resistant" algorithms, with improved resilience to number crunching by a quantum computer. ETSI and the Institute for Quantum Computing in Waterloo, Canada organize an annual workshop on Quantum Safe Cryptography that brings together researchers and companies working to introduce the new technologies needed. At last year's meeting in Toronto, we heard about the various government initiatives for quantum safe cryptography including standardization, recent technical progress and various industry perspectives. We encourage interested parties to attend the next workshop in London in September 2017.

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Industrial Standards for Quantum Cryptography

Continued (from page 10)

The need for industrial standards

The current global activity in quantum communications means that there is a pressing need to develop industrial standards. Standards are essential for ensuring the interoperability of equipment and protocols in complex systems, as well as stimulating a supply chain for components, assemblies and applications through the definition of common interfaces. Without standards there would be no global networks for fibre optic and mobile communications, or low cost consumer electronics based on reliable and widely available components from multiple suppliers. New standards are required to integrate quantum communications into networks and to stimulate its commercialization.

ETSI has been leading the development of industrial standards for quantum communications through the Industry Specification Group (ISG) for Quantum Key Distribution. Its mission is to develop ETSI Group Specifications (and since 2016 Group Reports) describing quantum cryptography for ICT networks. To date it has published several documents on QKD Use Cases, Application Interfaces, Security Proofs, Module Specification and Characterization of Components. The membership of the ISG comprises large companies, telecom operators, SMEs, national metrology institutes, government labs and universities and has representatives from North American, Asia and Europe. All ETSI members are welcome to join the ISG.

Current work items of the ISG focus upon the metrology of QKD systems, implementation security issues and deployment scenarios for QKD. Standards for the components used in QKD systems will stimulate a supply chain for the technology, through the definition of common interfaces and requirements. It will define a market for specialist devices such as photon sources and detectors. This opens new opportunities for component manufacturers, while providing hardware vendors with a broader and more reliable supply base.

Another highly topical area studied by the ISG concerns implementation security of QKD systems. Although the protocols for QKD can be proven to be information-theoretically secure, small deviations of real world systems from the theoretical model can open potential vulnerabilities. The ISG is therefore working on understanding the potential imperfections of real QKD systems, analysing the potential side channel and attack scenarios that these introduce and advising on countermeasures suitable to mitigate the threats.

It is very natural that work focuses upon implementation security issues as there are now sophisticated QKD prototypes with a high level of technology readiness. It should be noted that side channels are a feature of all cryptographic equipment, and are also a challenge for systems based on computational complexity.

However, quantum cryptography provides a particularly elegant solution to the implementation security problem. The technique of Privacy Amplification allows information-theoretic security to be restored, even for an imperfect QKD system, provided the extra information available to an adversary due to the flaws can be measured. The work in the ISG has therefore concentrated on metrology of QKD implementations and theoretical work on relating this to the potential information available to Eve.

The first type of active attack to be analysed in detail is the so-called Trojan Horse Attack, in which an adversary shines bright light into the QKD system and tries to gain information from the back-reflections without causing any disturbance. Work in the ISG has demonstrated that this attack can be rendered totally ineffective by adding a few passive components, a filter and optical isolator, to the QKD transmitter.

In conclusion, the work of the ETSI ISG on QKD is important to enable the future interoperability of the quantum communication networks being deployed around the world. Just as important, it will ensure that quantum cryptography is implemented in a safe manner that mitigates the risk of side channels and active attacks. By defining common interfaces, it will stimulate markets for components, systems and applications.

ETSI and IQC hold workshop on Quantum-Safe Cryptography

The 4th ETSI/IQC Workshop took place in Toronto, Canada, from 19 to 21 September 2016. The event was organized by ETSI and the Institute for Quantum Computing and sponsored by ISARA and Evolutionq. It opened on 19 September with a special Executive Track intended for business and security executives who needed to develop strategies for a quantum-safe future. The sessions on 20 and 21 September featured an in depth technical workshop designed to help industry participants move towards a standardized approach to quantum-safe cryptographic solutions.

As quantum computing is no doubt going to disrupt the IT landscape, a new suite of tools resilient to quantum computers must be deployed and standardized in order to maintain secure systems and ensure confidentiality.

This three-day workshop brought together players from the quantum-safe cryptography community at large, from around the world. It showcased the most recent requirements from industry and government, and cutting-edge solutions coming out of the latest research studies.

Attendees and presenters included experts from the fields of post-quantum (quantum resistant) cryptography, quantum key distribution (QKD), theoretical and commercial integration of cryptography and security tools, first-adopters of quantum-safe tools from industry and government, and members of standards bodies.

Voice of an SME! One small company's experience of ETSI

Francois Ambrosini, of IBIT Ambrosini UG, talks about his Work in ETSI TC RRS and TC CYBER

"I think it is appropriate to say that ETSI is among the most - if not the most - SME-friendly standardization organizations globally"

Q. You're a (very) small business owner/operator, yet an ETSI member and active in at least two ETSI committees. How did you come to hear about ETSI, and what are you trying to achieve by being involved in ETSI?

FA I first came to know about ETSI via the DVB Project when I was dealing with the standardization of mobile TV systems a bit longer than ten years ago. The need to get acquainted with 3GPP specifications quickly followed. Since then, ETSI regularly showed up in searches related to various topics of interest.

My activities involve counselling and being active in standardization. One of my objectives in ETSI is to identify gaps in standards for the benefit of my customers - who could then decide to start a standardization effort - or to leverage my flexibility in order to progress a specific work item that I would anticipate to be useful in the future. The work on access control currently undertaken in TC CYBER is an example.

Q. You are also active in TC RRS, which is looking at very advanced technologies, and where interesting scenarios are being developed. Can you tell us some more about them?

"Two notable technologies developed in TC RRS are Licensed Shared Access and the Software Reconfiguration Framework for Mobile Devices"

FA From my point of view, two notable technologies developed in TC RRS are Licensed Shared Access and the Software Reconfiguration Framework for Mobile Devices. The later has a particularly strong potential as it enables powerful and energy-efficient software defined radio on mobile or embedded terminals.

In a nutshell, this efficiency is achieved by implementing radio applications as a combination of software and hardware components. TC RRS defined a data model for the abstract representation of radio applications as a set of computing and memory resources which are then mapped to the specific hardware and software capabilities provided by a given reconfigurable radio platform. A set of interfaces are standardized to expose radio services to upper layers (such as the network layer), expose the radio platform to radio applications, and manage radio applications. The complete framework allows for a radio application ecosystem, yet gives manufacturers full flexibility in deciding to which extent their platform should be opened to third-party developers. For further details, I would recommend to start with the ETSI webinar recorded by key contributors in TC RRS: https://goo.gl/doFv30

In my opinion, radio reconfigurability for mobile devices will bring several benefits. Firstly, for the consumer, the lifetime of devices would increase as their radio is updated to the latest access technologies. Secondly, it would become possible to quickly deploy new systems with an existing radio access technology and transition to a more appropriate one when it becomes available. Thirdly, the reconfigurability of the mobile devices means that the network becomes fully mutable: the radio service can be seen as a virtual network function, the mobile device as a special kind of virtualization platform – not only for radio, actually. This positions the technology as a key enabler for 5G.

Lastly, security updates have de-facto become a mandatory practice and having a standardized update mechanism for the radio is a positive aspect. Radio chipsets have computing capabilities and as such their security must be taken care of.

Q. In TC RRS, you are looking at security of reconfigurable radios – what are the issues here?

FA We are actually two experts, with Scott Cadzow from Cadzow Communications Consulting, who is well known across ETSI's security work in TETRA, TC CYBER and other technical bodies. The first objective is to ensure that the introduction of radio reconfigurability does not jeopardize the security of the device. This requires

mechanisms to protect the integrity of radio applications during distribution and make sure that only authorized parties can install them on devices.

A key feature of the Software Reconfiguration Framework for Mobile Devices is its native support for the legal framework set by the Radio Equipment Directive of the European Union. The security model provides mechanisms for the manufacturer to ensure that the radio equipment remains compliant with the essential requirements of the directive after a reconfiguration has taken place, prevents falsification of the Declaration of Conformity as well as installation of non-compliant radio applications, and supports regulators in their market surveillance and disturbance control activities. These mechanisms are further extended to ensure the overall integrity and trustworthiness of the reconfigurable radio platform, as well as the confidentiality of key assets.

Long-term security support for all sorts of connected devices is one of the challenges that the IT industry is facing – which is exacerbated by the framework's ability to extend the device lifetime. There is a good opportunity to tackle this problem in TC RRS for the radio applications.

Scott Cadzow and I have recorded a webinar introducing the security model: https://goo.gl/TRrYFQ

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Voice of an SME! One small company's experience of ETSI

Continued (from page 12)

Q. What is your impression of ETSI, from the point of view of a small business?

FA From my personal experience, ETSI is very easy to engage with. For an affordable cost in relation to their actual ICT related turnover, small businesses are given the same rights and duties as other members and have access to all the facilities provided by ETSI. The ability to engage with ETSI and its members in standardization activities is thus only limited by one's own willingness rather than by prohibitive fees of membership tiers, as is often the case in other organizations. There is also a strong culture to cater for the interests of both big and small players, and promote a consensus-driven approach as much as possible. This is overall a very good setup for small businesses, which are not looking for hand-holding but fair access to the standardization scene. I think it is appropriate to say that ETSI is among the most – if not the most – SME-friendly standardization organizations globally, even for non-CEPT members.

"Small businesses are given the same rights and duties as other members and have access to all the facilities provided by ETSI"

Q. We could say you are an actor in the knowledge economy. To what extent has being involved in ETSI helped you with this?

FA ETSI is a powerful information hub for standardization in the telecommunications and information technology areas. In addition to the substantial body of knowledge available from standards, it provides long-term opportunities through its traditional Technical Committees and Partnership Projects as well as testing expertise with the Centre for Testing and Interoperability. Furthermore, it has managed to foster new activities through its Industry Specification Groups, regularly organizes workshops on various topics, drives the promotion of the work through white papers and webinars, and efforts are made to attract external expertise and researchers. Last but not least, being a European Standardization Organization, ETSI bridges the regulatory and industrial worlds on telecommunications matters, and is well connected to other organizations.

These are the reasons why IBIT Ambrosini UG has selected ETSI as its primary standardization organization: whether one is looking for expertise, an opportunity to standardize new technology, or to simply exchange ideas and build partnerships, there is a very good chance that ETSI is part of the solution.

Q. Do you have any particular advice to offer small businesses thinking of getting involved in standardization?

FA Always keep in mind the interests of other companies which you collaborate with, and be prepared to accept that one cannot always turn the group consensus to your advantage.

If you work for an SME and would like to see your company's work in ETSI profiled here, please contact us at newsletter@etsi.org

ETSI Security Week 2017

12-16 June 2017 at ETSI, Sophia Antipolis, France

Bringing the cybersecurity community together at ETSI to network and exchange on the state of standardization for cybersecurity.

For more information visit: http://www.etsi.org/etsi-security-week-2017

ETSI Awards Three ETSI Fellowships

Award Granted for Outstanding Contribution to ETSI's Work

On 29 November, during the 68th General Assembly, ETSI awarded three ETSI Fellowship awards to Alain Maloberti, Francisco da Silva and Oliver Wheaton. All three received their awards in recognition of their outstanding contribution to the work of ETSI.

Alain Maloberti has been intensively involved in the research, development and standardization activities of the GSM system since the mid-80's and has contributed heavily to standardization bodies. In ETSI he chaired the SMG2 group, in charge of the radio aspects of GSM for 10 years. In addition, he chaired the UMTS group preparing 3G standardization from 1990 to 1992. Alain Maloberti was active in promoting the GSM solution outside of Europe and therefore has contributed to a true global adoption of the standard. He is currently Senior Vice-President at Orange Labs Networks.

Francisco da Silva was influential in the CEPT committee that triggered the establishment of ETSI, as well as e.g in the CEPT group that determined the relative allocation of responsibilities on Radio spectrum matters between CEPT and ETSI. He was the chairman of ETSI General Assembly from 1998 to 2002 and chairman of the ETSI Board from 2002 to 2008. He continues to be active in the technical standardization work of ETSI and is a member of the Board of ETSI. He is currently Senior Counselor for standardization and Technical Regulation at Huawei Sweden.

Oliver Wheaton was the founding chairman of TC ERM from 1997 to 2005. During this time it grew to be one of the largest technical committees in ETSI in terms of participation and workload. He was instrumental in leading the group in drafting some of the most important ETSI standards, including those related to the R&TTE Directive, which continues to have a huge impact on the regulatory environment today. Oliver was the Deputy Director for Mobile Services in the UK Radiocommunications Agency (RA). He has taken the lead for ETSI in GRSC, and has led for the UK in ETSI's Technical Assembly and is currently the head of the UK delegation in ETSI's General Assembly.

The ETSI Fellowship programme rewards individuals who have made an outstanding personal contribution to ETSI, to building the work of ETSI, or raising its reputation in specific sectors of standardization. Any individual representative of an ETSI member may propose a candidate for an ETSI Fellowship. Fellowships are awarded each year by an Award Committee composed of the ETSI General Assembly chairman and vice-chairmen, the ETSI Board chairman and the ETSI Director General.

ETSI's General Assembly Chairman Reappointed, New Vice Chair Representing SMEs

At their 68th General Assembly held on 29-30 November 2016, ETSI members have re-appointed Mr. Simon Hicks of the UK government's Digital Economy Unit as Chairman of the ETSI General Assembly, for a two-year term of office.

At the same time, ETSI members have re-appointed Mrs. Isabelle Valet-Harper of Microsoft, and appointed Mr. Vladimir Poulkov as vice-chairs of the General Assembly.

Mr. Hicks is Principal Technologist in the joint departmental Digital Economy Unit, responsible for the development of UK policy for standards and technology activity in ICT, electronic communications and cyber security. A Chartered Engineer and corporate member of the Institution of Engineering and Technology, Mr. Hicks is also the UK's representative on the European Commission's Multi-Stakeholder Platform on ICT Standardization. Mr. Hicks has served as vice-chairman of the ETSI Board and has been a member of the Board of ETSI from 2002 to 2014. He has just completed his first term of office as ETSI General Assembly Chairman from 2014 to 2016.

Mrs. Valet-Harper is Senior Standards and Interoperability Strategist at Microsoft. She has been a member of the ETSI Board since 2011, and has participated in a number of French, European and international standards bodies including AFNOR, ETSI, ISO/IEC JTC1, IETF, W3C, 3GPP, Ecma International, OMA, the Multi Stakeholders Platform, etc. over the past 25 years. She held numerous official positions including Delegate, Editor, Chairman, President, Board Member and Liaison Officer. She has just completed her first term as ETSI General Assembly vice-chair, from 2014 to 2016.

Mr. Vladimir Poulkov has led many national and international industrial, R&D and educational projects such as the "Electromagnetic Compatibility of Communications Systems" R&D laboratories at the Technical University of Sofia. He is leading courses in the field of Information Transmission Theory, Broadband Transmission and Access Networks. He has also founded and chairs the Bulgarian Cluster of Telecommunications, a cluster whose members are leading telecom SMEs in Bulgaria, with portfolio covering almost the entire product range of telecommunication services.

ETSI's Director General, Mr. Luis Jorge Romero, works closely with the leaders of the General Assembly and the Board in the management of the institute. The General Assembly is the highest authority of the Institute, it meets twice yearly and is made up of the entire ETSI membership. Its chair and two vice chairs are elected for a two-year term of office and can serve a maximum of two consecutive terms.

Home Gateway Initiative Smart Home Specifications Published by ETSI

In November 2016, three Home Gateway Initiative specifications have been published as Technical Specifications by ETSI. Following the closure of the Home Gateway Initiative in June 2016, work on the three specifications was transferred to ETSI. They have now been published using the ETSI Publicly Available Specification process.

The three specifications are ETSI TS 103 424, which deals with smart home architecture and system requirements, ETSI TS 103 425 which describes requirements for Wireless Home Area Networks (WHANs) supporting smart home services and ETSI TS 103 426 which contains requirements for HGI Open Platform 2.1 regarding modular software deployments on the home gateway. They are also available at https://goo.gl/jsP0fg.

The ETSI Publicly Available Specification (PAS) process enables an organization which has signed an agreement with ETSI to submit one or more of its Publicly Available Specifications for adoption by ETSI as an ETSI Technical Specification or ETSI Technical Report. A Publicly Available Specification published as an ETSI Technical Specification benefits from ETSI's recognition as a European Standards Organization and reputation as a provider of standards for global use. Submitting a PAS to be published by ETSI can also be a first step towards it becoming a European Standard. These three specifications from the HGI are the first to be published by ETSI under its recently revised PAS process.

Enrico Scarrone, chairman of ETSI SmartM2M Technical Committee, said: *"HGI consulted closely with ETSI SmartM2M during the development of these key documents. This work complements our own work on smart appliances very well, and we're happy to integrate these HGI requirements into our family of specifications."*

ETSI Launches First European Live Trial for Intelligent Transport Systems

Testing Event in Livorno Shows Convergence Between IoT and ITS

ETSI announced its 5th ETSI ITS Plugtests™ event, a two week testing event for co-operative transport systems focusing on vehicle-to-vehicle and vehicle-to-infrastructure communications. Testing took place from 7 to 17 November around the port of Livorno, Italy. In addition the Sea Port Innovation Conference was held on 16 and 17 November where attendees were able to take a demo tour on the test track.

ETSI has worked for several months with its partners ERTICO, CNIT, Livorno Port Authority, Regione Toscana (Tuscan Regional Government), AVR (Livorno/Florence highway), Autostrade Tech (motorway network), and Telecom Italia to put in place the testbed. This event contributes to ITS deployment, tests interoperability of ITS equipment from all key vendors and demonstrates the convergence between ITS and Internet of Things.

This event trialed the ITS eco system under real life conditions from infrastructure to applications in vehicles, thus demonstrating conformance to ETSI ITS Release 1 standard and interoperability of ITS G5 radio equipment. Companies from Asia, Europe and North America had the opportunity to connect their equipment to the test infrastructure. This was a unique chance for solution providers to maximize the effectiveness of their ITS solutions in urban environments.

"In collaborative ITS communications, interoperability is key and this is a great opportunity for solution providers to test their products. The fact that companies from different ITS sectors are increasingly involved and ready to test under real life conditions shows the high level of maturity of ITS standards and implementations" said Marco Annoni, ETSI ITS Vice-Chair.

In Livorno, the cruise terminal was the testbed headquarters and a test-drive path was used for quick setup of testing equipment in the field. The infrastructure included a 10 minutes test drive on the Livorno-Florence highway, an IoT testbed enabling a set of specialized test cases on large-scale distributed sensing and actuation. The latter can be seen as a vertical realization of M2M communications in the context of Intelligent Transport.

The test site included variable message signs, traffic lights, IoT sensors and cameras as well as connectivity with the highway control center. Different topics were addressed, including road hazard signaling, traffic sign violation, intersection collision risk warning and loading zone management.

"We were very excited to partner with ETSI for this first real life event. Over the past few years we have organized testing events and created an Interoperability Interest Group to enlarge the scope of these activities and cooperate with third parties in the development of an ITS standardization roadmap" said ERTICO CEO Hermann Meyer.

Latest ETSI White Papers:

Tackling the Challenges of Cyber Security

Developed by the chairman of our Technical Committee CYBER, this document provides an overview of all ETSI work related to Cyber Security and outlines some of our targets and aspirations for coming years.

Available from: https://goo.gl/2avQAn

Ensure interworking between multiple Contactless Card Emulation Environments

Joint white paper between ETSI, GlobalPlatform and NFC Forum.

This white paper is intended for executives in OEM, contactless products, and service providers, especially Mobile Network Operators, payment service providers, transport service providers, and all service providers offering contactless services to be hosted in devices such as mobiles. It informs system integrators and engineers how GlobalPlatform technologies can be used to build a standardized NFC-ecosystem integrating several Card Emulation Environments.

Available from: https://goo.gl/tF2Vd5

ETSI Next Generation Protocols Group Releases First Specification

Scenarios for a 21st Century Internet

On 10 October 2016, the ETSI Industry Specification Group on Next Generation Protocols (NGP ISG) announced the release of its first specifications, GS NGP 001: Next Generation Protocols; Scenarios Definitions. This document defines key scenarios to evolve the current Internet Protocol (IP) suite architecture and addresses the future technologies that will be embedded in next generation networks. The aim is to provide all stakeholders with harmonized requirements that will be suitable for multi-access communication including wireless, wired and cellular communications.

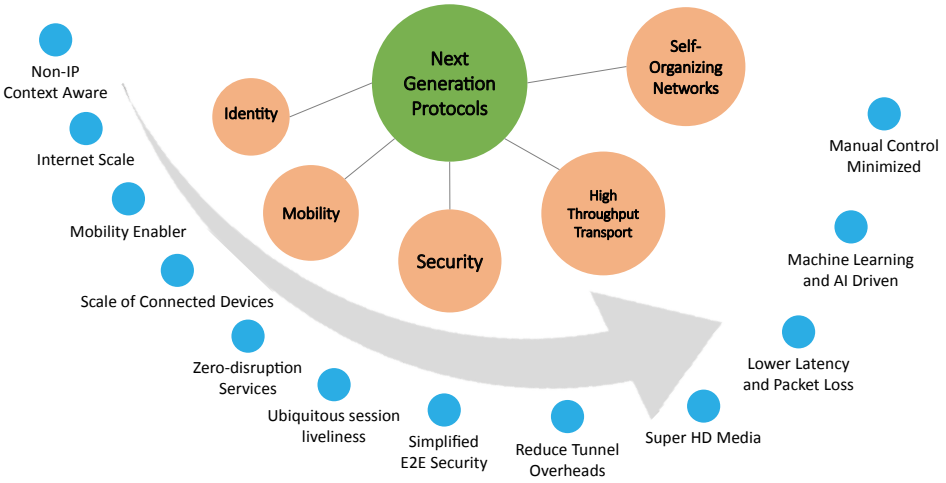
IP protocols have been defined in the 1970's but a ubiquitous internet requires a different approach today, with new security, addressing and mobility issues to take care of.

"Current and future use cases include 4K videos on various devices, massive IoT, drone control or virtual reality to name but a few: use cases that have nothing to do with those of the 70's. A modernized network protocols architecture had to be triggered and this is why NGP ISG was created in January 2016", says Andy Sutton, Chairman of NGP ISG.

GS NGP 001 scenarios comprise addressing, security, mobility, context-awareness, performance improvement and content enablement as well as multi-access, Internet of Things (IoT), virtualization, mobile edge computing and energy saving.

With this document, ETSI NGP hopes to influence the key communications standards bodies (e.g. 3GPP, ETSI, IEEE, IETF, ITU-T) to shape their protocol evolution for 5G systems and 21st century networking technology so as to address the issues identified and meet the recommendations provided. The document also compares and contrasts existing IP suite protocols with next generation networking and internetworking protocol architecture proposals.

ETSI Next Generation Protocol Vision



ETSI's HbbTV 2.0.1 Standard Implemented in the UK and Italy

Over 20 Countries Worldwide Benefit from HbbTV Services

The newly published ETSI specification TS 102 796 V1.4.1 on hybrid broadcast broadband TV (HbbTV) will allow the United Kingdom and Italy to implement the latest technologies in their receivers.

With the large installed base of receivers in the UK and Italy, there will be a transitional period where broadcasters will provide apps and services in both the old (respectively MHEG and MHP) and new formats, before manufacturers gradually upgrade their equipment to provide full HbbTV support in 2017.

"Having the UK and Italy switch to HbbTV is a big step for the broadcasting sector. It shows how the whole industry can move forward and benefit from the economies of scale with a single standard", said Simon Fell, chairman of ETSI joint Technical Committee Broadcast. *"We hope more and more countries will implement HbbTV specifications."*

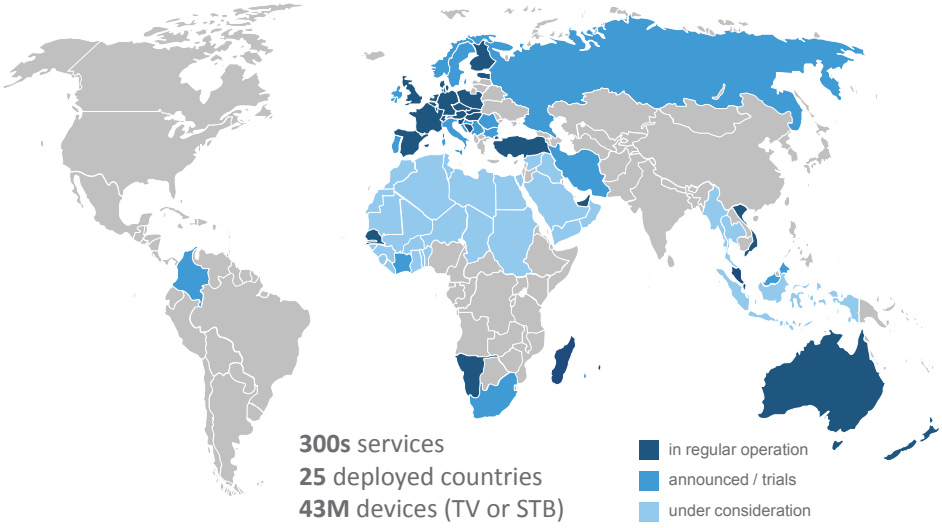
Having started in France and Germany, HbbTV is now a global success with over 20 countries using hybrid broadcast broadband TV services, 250 apps deployed and 300 million powered devices.

HbbTV allows broadcasters to include advanced interactive services and Internet applications such as information services, catch-up services, video-on-demand, electronic programme guide, and interactive advertising. Users can access these services through connected TVs, set-top boxes, and through the connection with a companion screen, on smart phones, computers and tablets.

HbbTV is now a global success with over 20 countries using hybrid broadcast broadband TV services

Products and services using the HbbTV standard can operate over different DVB broadcasting technologies, such as satellite, cable, or terrestrial networks.

HbbTV Deployment Map



ETSI Workshop Considers Evolution of Rail Mobile Communications

Developing the Next Generation Radio for Rail

ETSI's first workshop on the next generation radio for rail took place on 2-3 November at ETSI headquarters, Sophia Antipolis. As European rail operators are finalizing the roll-out of GSM-R, the railway telecommunications system standardized by ETSI, the mobile industry has started working on the standards for a 5G mobile communication system. It is therefore time to consider the evolution of railway telecommunications beyond GSM-R.

ETSI is the home of the GSM-R standard, developed in our Technical Committee for Railway Telecommunications (TC RT). In parallel, 3GPP, of which ETSI is a founding partner, has launched a study item on future railway mobile communication system.

ETSI invited all stakeholders interested in the development of GSM-R and its evolution to participate in this event. This was the opportunity to exchange information on the current status of work, on both short term and long term developments, to better understand the challenges, benefits, spectrum needs and opportunities, to evaluate the attractiveness of future technologies and to consider synergies with other sectors. These themes were addressed in four different tracks, each followed by a Q&A session.

To know more about the event, go to: www.etsi.org/ws-rail-mobile

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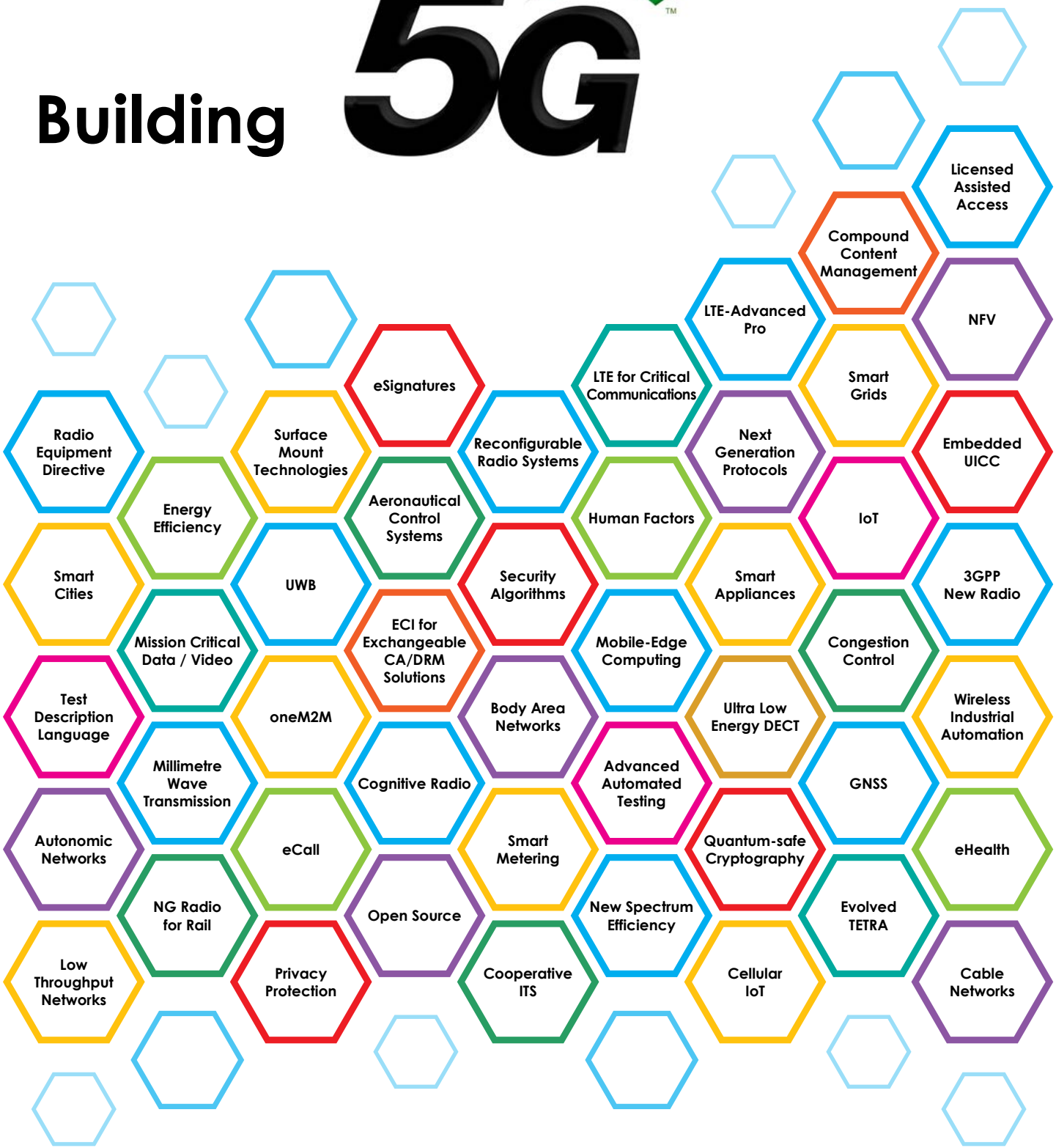

ETSI 2017 EVENTS CALENDAR - What's on?

1-2 March	Cinema Mezzanine Plugfest 3	Erlangen, DE
6-7 March	India M2M + IoT Forum	New Delhi, IN
6-10 March	ETSI NG112 Emergency Communications Plugtests #2	Sophia Antipolis, FR
7-10 March	India Smart Grid Week	New Delhi, IN
16-17 March	Innovative Cities India Summit 2017	Bengaluru, IN
21-24 March	MPLS+SDN+NFV World	Paris, FR
6 April	ETSI Summit on 5G Network infrastructure	Sophia Antipolis, FR
2-5 May	NFV World Congress	San Jose, US
10-11 May	ETSI Workshop on Multimedia Quality in Virtual, Augmented or other Realities	Sophia Antipolis, FR
16-18 May	Critical Communications World	Hong Kong, CN
29-31 May	Network Virtualization Europe	Madrid, ES
12-16 June	ETSI Security Week	Sophia Antipolis, FR
13-15 June	5G World	London, UK
13-15 June	Connected Cars	London, UK
13-15 June	Internet of Things World Europe	London, UK
13-15 June	Apps World London	London, UK
19-23 June	Mission Critical Push to Talk (MCPTT) Plugtests	Sophia Antipolis, FR
15-19 September	IBC 2017	Amsterdam, NL
19-21 September	MEC World Congress	Berlin, DE
9-13 October	SDN NFV World Congress	The Hague, NL
24-26 October	Broadband World Forum	Berlin, DE

Please visit the events section of our website for further details

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