THE STANDARD

News From ETSI · February 2016

MADE IN EUROPE FOR GLOBAL USE

ETSI Seeks Harmonization of NFV Information Modelling Across Standards Bodies and Open Source

First multi-organization workshop bringing the NFV community together

ETSI's Industry Specification Group for Network Functions Virtualisation (ETSI NFV) has convened a ground-breaking industry workshop to align cloud-centric initiatives and network-centric initiatives to ensure successful realization of NFV through automation. The workshop brought together the leading Standards Development Organizations (SDOs) and Open Source communities in an 'NFV Village'. The workshop was hosted by CableLabs at their Louisville, Colorado (USA) location on 13-14 January 2016.

This was a significant and unique event because it is the first time the key standards organizations and open source communities representing a broad and diverse ecosystem have met together with a common purpose to accelerate alignment of their activities in relation to NFV.

3GPP Starts Work on NarrowBand IoT Standards

A major milestone was achieved in September 2015 in 3GPP RAN plenary meeting with the decision to standardize NB-IOT, a new narrowband radio technology to address the requirements of the Internet of Things (IoT). The new technology will provide improved indoor coverage, support of massive number of low throughput devices, low delay sensitivity, ultra-low device cost, low device power consumption and optimized network architecture.

5G Standardization: A Demanding Task

But all the right things are in place – Interview with Adrian Scrase, ETSI CTO

5G has gained momentum over the last 2 years, which is set to continue with $25 billion to be spent on 5G research, trials and development during the next five years[1].

As ETSI CTO, Adrian Scrase is well positioned to give an overview of the work done both in ETSI and in its partnership projects such as 3GPP. In an exclusive interview, he gives us his insights on the way forward for some of the exciting and innovative technologies and the opportunities 5G will provide to industry and consumers.

[1] Source Juniper Research: http://www.juniperresearch.com/press/press-releases/5g-revenues-forecast-to-exceed-65bn-usd-by-2025

Q. The 5G landscape seemed to be very scattered at the beginning, with a lot of fora, consortia, research projects around the globe working on future network technologies. Is this still true today?

A. Yes, there is a lot of research activity ongoing but we're already starting to see the first results of that activity. But this is quite normal as there are many actors that wish to make a significant contribution to 5G. At this stage, we shouldn't be surprised by this plethora of activities. The standardization process though is very clear, ETSI has a very clear view on the way forward.

Welcome to the World of Standards

Welcome to the February 2016 edition of The Standard. As you can see, we have refreshed the design more than five years after first launching this newsletter.

In this edition, we take a look at the status of work in ETSI and 3GPP on 5G mobile standards. We have an interview with Adrian Scrase, ETSI's CTO, in addition to updates from our Mobile Edge Computing, millimetre Wave Transmission and Network Functions Virtualisation ISGs. We are announcing the upcoming ETSI Summit on 5G: From Myth to Reality. We have other news from 3GPP, where we take a look at their plans for standardization of NB-IOT, and from oneM2M where we hear about their first interoperability event.

Security is a constant preoccupation of our industry and the chairman of TC Cyber, Charles Brookson, outlines why security standardization is so important. We also have a report from our Quantum Safe Cryptography workshop last year.

If you missed our ETSI Summit on Open Source and Standardization held last November, you can read about this important and timely event. Our list of upcoming events and workshops is on the back page as usual – please register quickly, especially to those being held at ETSI as they fill fast. You will find an update on our Cloud Standardization Coordination activity, two more white papers published and a number of other interesting articles. I hope you enjoy them all.

Luis Jorge Romero,
Director General, ETSI

Sowing ETSI's Future

ETSI's Director General, Luis Jorge Romero, outlines his vision of ETSI's future

The end of 2015 seems to signal another milestone in ETSI's history. After I have spent more than 4 years at ETSI's helm, the General Assembly kindly accepted during its 66th meeting to extend my term in office for 3 more years, which allows me to keep on working for this Institute but, more importantly, for all its members up to July 2019.

With the occasion of this event and taking advantage of the publication of The Standard, I would like to share with all our readers in a few words what I believe have been ETSI's achievements in these past years and also succinctly depict my vision for the Institute in the years to come.

Time to harvest

We have had a good crop of achievements during these past years. Even if the weather hasn't always been favourable, and despite some thunderstorms in our way, I think I can proudly say that ETSI has been successful thanks to the knowledge, hard work, and motivation of its people and our cohesion as a team.
It is worthwhile remembering our key achievements, starting from those close to the heart of the organization:

➤ We started with the refurbishing and conformity of ETSI buildings to French law, making them a better home for our members. It's been a long ride, but the outcome is worth the effort.

➤ ETSI's success is fundamentally based on the quality of its people. I believe we have a sound work environment and teams focused on delivering.

➤ Despite the world's economic difficulties, in ETSI we have been able to keep a sound financial situation, with no additional burden on our members.

➤ We have also strengthened ETSI's legal services to address the challenging IPR issues at institutional level and in technical committees and partnerships, but also commercial contracts and measures pertaining to our legal protection and that of our members.

➤ ETSI's work programme has expanded, both in conventional domains such as mobile communications and radio standardization as well as in less familiar areas such as digital signatures, quantum safe cryptography, NFV or mobile edge computing. This enlargement of the work programme both in scope and in depth contributes to positioning ETSI as a lead SDO for ICT, in Europe and beyond.

➤ ETSI's visibility has improved worldwide, leveraging on means such as: communication via social networks; our new website; more workshops being hosted in ETSI HQ thanks to our refurbished amphitheatre; and the leverage of our ISG model to attract new work and participants to join ETSI.

➤ We have also rebuilt and developed our relationship with the EC both at operational and strategic level, with a focus on DG CONNECT and DG GROW. The fluid relationship contributes to positioning ETSI as the preferred point of call for policy topics that call for standardization, e.g. Cloud and the Internet of Things.

➤ Last, though not least, we have also improved our relationship with CEN and CENELEC. Despite our differences the dialogue is now open and constructive.

But our fields are ready for some more seed. The soil is excellent, the products superb, and the people working on them, second to none.

We are developing a team culture, based on respect for all. Focused on providing service and value to our members. Listening to our members' wishes. And understanding. And delivering, on time.

So, what next?

Sowing for tomorrow

Besides our very solid foundations, ETSI's future will be built sustained by four pillars that will contribute to satisfy our members' demands. Those pillars are:

➤ Quality. For everyone. For everything. Everywhere. Quality is non-negotiable. ETSI shall strive – and shine – for its quality, second to none.

➤ Flexibility. To adapt to new methods, approaches, ideas, models... always staying at the forefront of technologies and trends. Always anticipating for the good of our members, and at our members' disposal. There will be nothing that ETSI cannot cope with. This one, together with quality, will be part of ETSI's mantra – and culture.

Sowing ETSI's Future – Continued

ETSI's Director General, Luis Jorge Romero, outlines his vision of ETSI's future

> Reputation and visibility. Not only is ETSI excellent, but it is known for it. We believe in ourselves and strive to have reasons to believe. And then, we show the world our excellence with facts. But we show it and don't shy away.

> Respect for what we are. Clear and transparent rules and governance, which give our members the trust and confidence to keep working in ETSI.

With these pillars and our foundations ETSI will sustain its strategy for the years to come. This strategy – the ETSI Long Term Strategy (LTS) – covers the years 2016 to 2021 and is in the process of being finalized under the leadership of ETSI's Board.

The Long Term Strategy (LTS) will be further developed before being approved and published, hopefully by ETSI's 67th General Assembly in April 2016. However, I believe I disclose nothing by saying that the LTS is constructed along four main lines:

> ETSI is at the heart of ICT, this is our nature.

> Emphasis on ETSI's role as enabler of standards, beyond a simple standards making organization. ETSI also helps set the ecosystem and create the communities and conditions for the development of standards, before,

during and after the writing of the technical specifications, in whichever shape and flavour.

> Highlight ETSI's global footprint, with a strong, consolidated and solid European root. ETSI extends well beyond Europe, both in terms of our members' origins (headquarters, nationalities) and of the applicability of the products developed against the specifications that we produce.

> ETSI is versatile and able to adapt to any new trend and need. Change is the only inevitable constant, which ETSI is fit for.

With these ambitions, ETSI is leading the development of ICT standards in some of the most promising technology areas, namely:

> 5th Generation Communication systems, or 5G. And some other key building blocks that could potentially be part of our next communications system, such as the virtualization of network functions (Network Functions Virtualization, NFV), pushing the intelligence of the core in the mobile network towards the edge (Mobile Edge Computing, MEC) or studying the behaviour of radio waves in the millimetre band (millimetre Wave Transmission).

> The Internet of Things and anything this concept would further enable,

such as Industry Digitalization, Smart Cities, Smart Grids, etc. This will as well fuel cooperation with economic sectors beyond ICT: manufacturing, energy, banking, etc.

> Security at large, seen "per system" – security by default, or by design – but also seen as a whole, looking at the different threats in cyberspace and including the advent of quantum computing.

> Determined approach at new ways of working, more in line with the needs of IT developers who implement our standards. This will bring new ideas and fresh methods to our processes, all aimed at improving... and remember: quality is non-negotiable!

You will probably agree with me that the challenge is huge. But I feel absolutely motivated and convinced that in ETSI, working all together, we'll be able to achieve our aims... if not more! I say this based on our foundations and on the superb people in ETSI, complemented, I'm sure, by the ambition, motivation, commitment and contribution of all ETSI members. Even if I'm not very good at reading my crystal ball, I know this gives us many chances to succeed. With these cards in our hands, how can we lose?

Luis Jorge Romero,
Director General, ETSI

ETSI Releases New Specification for HbbTV 2.0

An enriched experience for interactive TV on all devices

To date, over 20 countries have launched HbbTV services.

ETSI has recently released the latest specification on hybrid broadcast broadband TV (HbbTV), TS 102 796 V1.3.1 (at http://miniqr.com/etsiorg.r), which corresponds to HbbTV 2.0. The latest HbbTV release adds support for new capabilities including companion device support, HTML5 user experience and support for advanced video delivery features such as Ultra HD and High Efficiency Video Coding (HEVC) to enhance the consumer experience. The HbbTV standard allows creation of TV services that combine broadcast and over-the-top content. This hybrid broadcast broadband TV standard

creates a global open platform as an alternative to proprietary technologies and extends the user experience.

To date, over 20 countries have launched HbbTV services. These services enable consumers to access a broader range of content which enhances the broadcast programme. It also 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. Products and services using the HbbTV standard can operate over different

DVB broadcasting technologies, such as satellite, cable, or terrestrial networks.

The newly released version of TS 102 796 specification includes enhanced features taking into account evolving technologies such as HTML5, HEVC for broadband-delivered video and Timed Text Markup Language for broadband-delivered subtitles and improved user privacy. It also adds support for communication and synchronization between an application on a TV/set-top box and a related application on a smart phone or tablet. Video/audio files can be pushed via broadcast to local storage in a device for later consumption.

5G Standardization: A Demanding Task – Continued (from page 1)

> **I'm confident that we have all the right things in place to deliver a compelling set of 5G standards by the 2020 deadline.**

Q. Recently the European Commission wanted to discuss progress on 5G, do you think Europe is behind other regions on 5G?

A. I think this is important to understand that 5G is not a race. Yes, we have clear targets for the availability of 5G standards and we have a clear commitment to meet those targets. But the market conditions in each region differ significantly so we should not expect deployment in all regions to occur in the same time frame. There's no prize for being the first region to market. Deployment will be based on sound business decisions, and those decisions will be based on a complex mix of parameters. What is pleasing to see though is that we do have strong cross regional coordination which is taking place in many different ways, certainly within the research stream, within standardization and even with the establishment of bilateral trade agreements. So I think for the first time we see quite widespread cross regional coordination which we haven't seen to that extent before.

Q. 3GPP is established as the place for mobile system standardization, ranging from 2G GSM evolution, 3G UMTS and HSPA to 4G LTE-Advanced and now LTE-Advanced Pro. How does the drive for 5G and the IMT2020 submission deadline from the ITU impact 3GPP's work?

A. Well, 3GPP has a very clear understanding of the demanding task ahead of them and is putting in place mechanisms to respond to the 2020 headline date of the standards availability. What is clear though is that world plans are being established to develop a 5G standard system. Significant work is still being undertaken to evolve the existing LTE and LTE-Advanced systems, and 4G has a long way to go yet in terms of enhancing performance and user experience. It's just as important that we continue to evolve the 4G system as well as making plans to develop a 5G system. Looking toward 5G then, this presents an opportunity to really rethink many of the basic assumptions on which previous generations have been based and to look outside of the box to leverage results from recent research and emerging technology advances. The results of this work will surely be a very compelling submission of a candidate 5G system which will be presented under the IMT 2020 process being put in place by the ITU.

Q. What does 3GPP foresee as the main features that will deliver 5G mobile networks?

A. Currently there is a view that the use of the 5G system can be divided into three high level families of use cases. The first of these is evolved mobile broadband, so taking the broadband capabilities we have today and enhancing them considerably in terms of user experience and performance. The second high level category of use cases concerns massive connectivity, this is based on the assumption that there'll be billions of devices interconnected in the future network and to do that we have to make sure that the 5G system is capable of supporting them. And the third category of high level use cases really concerns the high performance, high availability, low latency use cases, those which might be used in mission critical applications. So we need to ensure that any future system is at least capable of supporting those three families of use cases.

Q. ETSI has launched specification groups on NFV, MEC and mwT. These technologies are considered key components of the next generation of connectivity, how do they fit in?

A. Well, ETSI is engaged in a number of activities that will form building blocks on which 5G will be based, and it's evident right now that 5G networks will consist of large elements of virtualization. ETSI's ISG NFV activity will be particularly relevant in that respect. It is also clear that if we want to achieve the 5G objectives for very high performance and high availability, we will have a demand for much more spectrum in order to achieve those objectives. If you want a lot more spectrum, obviously spectrum is more readily available in millimetric wave bands, not in bands below 6 GHz. In this case then ETSI's studies into millimetre wave transmission through the ISG mWT will become particularly relevant in ensuring that we have good knowledge on which to base our 5G systems. Likewise if you want to achieve very low latency, it makes sense to place the computing functionality as near to the end users as you can, and this is the aspiration of ISG MEC, the Mobile Edge Computing ISG, where they are looking to see how you can place computational functionality as close as you can to the end user. And these are just three examples of activities taking place in ETSI which will form these building blocks of 5G. There are more that are currently being prepared and you will see them enter the standardization process in the coming months.

Q. On spectrum, which is critical to the whole ICT industry, are regulators already working on meeting 5G requirements?

A. You know, spectrum is a key parameter of any radio system, it is certainly a big discussion point for 5G. The process to obtain new spectrum is very clear, it's very well documented and we know how to do that, but it does take a long time. So you need many years of planning before spectrum actually becomes available for any new service, so the sooner you start, the better. ETSI's role though is not so much in influencing the availability of spectrum. Our role is much more to ensure compatibility between the different uses which may occupy adjacent spectrum. We also ensure that we are making the very best use of this spectrum and are looking for ways to improve spectral efficiency by using modern and up to date methodology. There are a number of cases in ETSI where we have done just that, particularly looking at more advanced techniques for sharing spectrum, for example.

Q. What will 5G really bring to industry and consumers that they can't have today?

A. That's a very good question and the difficulty is actually trying to guess what to do with a mobile system in 5 to 10 years' time. It's what we haven't been good at trying to predict, how the systems will be in the future. I think it's important when we make our plans for 5G that we design a system that is very agile, very versatile and easily adaptable to support many use cases of which we have no knowledge right now but which may become important in the future. The system designed should have that versatility built in from the very outset.

Q. Given the huge amount of work that lies ahead to meet the IMT2020 deadline, do you think we'll be ready for it?

A. Actually yes, I'm really confident we will. You're right, there's an awful lot of work to be done but we're quite good at doing this. That's what ETSI and 3GPP have demonstrated over previous generations. What is interesting is if we look both at ETSI and 3GPP from a membership point of view, we see growing membership, we see membership from categories where we have not previously enjoyed real input to the process. So whichever way we look at the work, we have a greater input from industry to the standardization process. It will need very careful, meticulous planning but I'm confident that we have all the right things in place to deliver a compelling set of 5G standards by the 2020 deadline.

ISG mWT: Update from ETSI's Industry Specification Group on Millimetre Wave Transmission

Future mobile and fixed networks beyond 2020 need to support vast numbers of applications and services, with capacity requirements 1000's of times the capacity of current networks. This will have an impact on fixed and mobile transport networks, requiring links offering 10s of Gbps. This raises the importance of millimetre wave radio as an enabler for such high capacity for backhaul and access networks.

Millimetre wave spectrum, in the 30GHz to 300GHz range, offers more available spectrum than in lower bands with larger channel bandwidths granting a fibre like capacity. The spectrum can be made available readily and can be reused easily, and lower licensing costs lead to lower total cost of ownership and lower cost per bit of radio systems.

ETSI's Industry Specification Group on Millimetre Wave Transmission (ISG mWT) has become the industry-wide platform where those interested in millimetre wave technology can create the conditions for large scale usage of this still largely untapped spectrum resource.

In its first year of activity ETSI mWT has significantly increased its visibility in the industry, attracting more than 30 companies (telecommunications network operators, equipment manufacturers, component manufacturers, research institutes) to work together. The group has gained a reputation for the quality of its publications and for several contributions to forums and events.

In particular, during the first year of the ETSI mWT several ETSI White Papers and Group Specifications have been published:

➤ ETSI White Paper: Worldwide regulations for the V-band (57 to 66 GHz) and E-band (71 to 86 GHz)
➤ ETSI White Paper: Maturity and field proven experience of millimetre wave transmission, aiming at increasing operators' confidence in the use of millimetre wave technologies by sharing the results of trials and early roll-outs on V-band and E-band.
➤ GS mWT 002: Applications and use cases of millimetre wave transmission (at http://miniqr.com/6fbd1.r)
➤ GS mWT 006: Analysis of antennas for millimetre wave transmission (at http://miniqr.com/5a34a.r)

The following publication has also been concluded and is in the pipeline for release by ETSI:

➤ ETSI White Paper: Status and Evolution of mm-Wave Semiconductor Industry Technologies
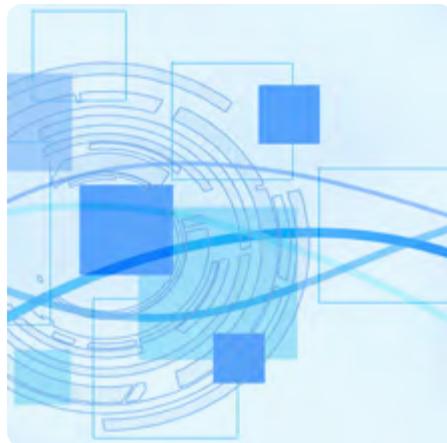
Other work items are in progress with the aim of producing simulation analysis results of high density deployment in the V-band, mainly targeting backhaul of small cells.

Further studies have also been started in the ETSI mWT. One is related to exploiting the much wider spectrum available above 90 GHz allowing link capacities in the order of 50Gbps. Another one deals with investigating the applicability of advanced antenna technology to point-to-point radio systems.

ETSI ISG mWT will continue to lead and give guidance on the use of the millimetre waveband, providing overviews of the trends in technology, applications and systems requirements through active collaboration with other standards organizations.

ETSI Summit 2016

5G: From Myth to Reality

Although 5G is intended to support a very wide range of innovative services, three specific classes of use cases are emerging as candidates for early prioritization: enhanced mobile broadband, massive machine communications and ultra-reliable/low latency communications.
This ETSI summit will address these use cases from a socio-economic and technological viewpoint with questions such as:

➤ What are the real requirements and expectations of stakeholders?
➤ What are the motivations and business models behind the use cases?
➤ How does the 5G roadmap compare to the LTE roadmap?
➤ Why is 2020 important?

Join us on 21 April 2016 at ETSI to find out!

http://www.etsi.org/summit-5g

New ETSI White Papers
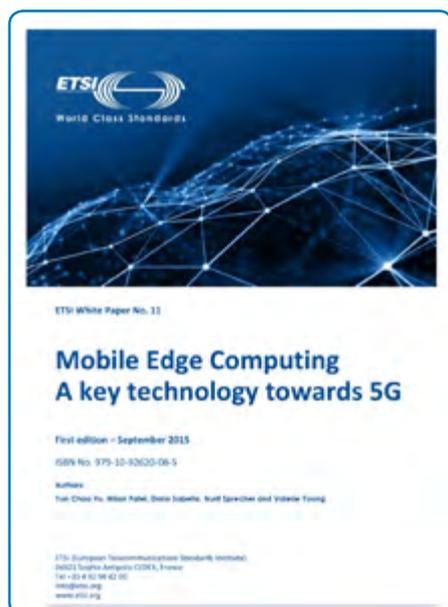
Maturity and field proven experience of millimetre wave transmission

Developed by members of our millimetre Wave Transmission Industry Specification Group, this white paper summarizes the experiences gained in some trials and installations made with equipment for fixed service point-to-point communication using millimetre waves grade installations for more than ten years. A wealth of data and experience have been gained during this period and the technology has matured to be stable, reliable and well understood, ready for supporting current and next generation high capacity mobile networks.

Mobile Edge Computing – A key technology towards 5G

Developed by members of the Mobile Edge Computing Industry Specification Group, this white paper introduces the concept of Mobile Edge Computing and the related key market drivers, and discusses the business and technical benefits of Mobile Edge Computing. A few examples of service scenarios that can benefit from the technology and possible deployment scenarios are presented. The white paper explains what is being standardized and how innovation can be stimulated through using a standardized API.

This white paper describes the MEC PoC framework and calls for active participation.

ETSI Mobile Edge Computing ISG Announces First Proofs of Concept

MEC ISG celebrates first anniversary

One year after its first meeting, ETSI's Industry Specification Group on Mobile Edge Computing (ISG MEC) met at ETSI for its fifth meeting and announced three Proofs of Concept demonstrations. Mobile Edge Computing is considered a key technology for future 5G networks and the initiative gained momentum over the last year, with many articles and papers referring to Mobile Edge Computing and market intelligence reports on MEC from IDC, ABI and Gartner, for instance.

The ETSI ISG MEC has already published two specifications on service scenarios and a Proof of Concept (PoC) framework as well as a white paper. Four MEC Proofs of Concept have been developed to demonstrate the following scenarios:

➤ RAN-aware video user experience optimization
➤ Edge video orchestration and video clip replay
➤ Radio aware video optimization in a fully virtualized network
➤ FLIPS – Flexible IP-based Services

Ongoing work in the ISG includes development of specifications on technical requirements and use cases, framework and reference architecture, MEC metrics best practice guidelines, business case examples, or market requirements for a multivendor ecosystem, demonstration kits and a tutorial. Early 2016 the group will start working on platform services, APIs and interfaces. The MEC APIs will be application-agnostic and will allow the smooth porting of value-creating applications on every mobile-edge server with guaranteed service level agreement (SLA).

Mobile Edge Computing complements NFV and SDN, helping to advance the transformation of mobile broadband networks into a programmable world and enables a myriad of new use cases, with fresh business opportunities. It provides a new hub where mobile operators and application/content providers can collaborate. MEC technology enables the transition towards 5G and is a key enabler for IoT and mission-critical vertical solutions.

ETSI Investigates Powerline HDMI for Very High Bit Rate HD and UHD Video

ETSI's Powerline Telecommunications Technical Committee (TC PLT) has recently published a Technical Report assessing the benefits of the powerline HDMI technology (PHDMI) for HD/UHD video transmission.

The adoption of HD video content has led to standards such as HDMI® and DisplayPort, to interconnect multimedia equipment, capable of multi-gigabit per second throughput. Indeed uncompressed HD video transmission requires very high bit rates, up to 2 to 4 Gbit/s for Full HD video. However consumers value the flexibility provided by wireless connections to set up and reconfigure multimedia systems, and to eliminate wired connections required by HD multimedia systems, such as home theatres.

To rise to this challenge, ETSI's Powerline Telecommunications Technical Committee published a technical report ETSI TR 103 343 (at http://miniqr.com/etsi.r) to investigate the transportation

over powerline technology of uncompressed video from HDMI short range links. Both single input single output powerline and multiple input multiple output powerline capabilities were investigated, along with specific compression schemes including wavelet based compression/decompression algorithms and joint-source channel coding schemes.

ETSI TR 103 343 provides recommendations to offer the best user experience with PHDMI in different realistic scenarios. Targeted applications include multimedia wired high speed links in home video networks or video surveillance operating from multiple HD or UHD video cameras in future Smart Cities schemes.

Roger Samy, the Chairman of ETSI TC PLT, stated that *"Using HDMI links over powerline following the recommendations in this report, ETSI PLT demonstrates a solution for a real Plug and Play technology and not Plug, Plug...and Play".*

ETSI M2M Event Highlights Need for Interoperability in the IoT Landscape

Showcasing oneM2M specifications implemented around the world

To address the M2M and IoT market, ETSI held its annual M2M Workshop featuring the oneM2M Showcase from 9 to 11 December 2015 in its headquarters at Sophia Antipolis, France. The programme included a wide range of presentations, exciting panel sessions, live surveys as well as demonstrations implementing oneM2M specifications.

With the relentless expansion and importance of IoT (Internet of Things) applications in our daily lives, this workshop was a must-attend event for anyone involved in IoT standardization. Participants came from various industries, academia, standardization bodies and the European Commission. There was a special focus on smart cities and smart living.

Sessions included interactive presentations covering market and industry trends for IoT, platforms, architectures and semantic interoperability. The focus on smart cities and smart living looked at current standards being used, as well as feedback from implementation and large scale projects, such as the Busan smart city project in Korea based on oneM2M standards. Other presentations included an introduction to the newly released ETSI specification on a reference ontology for Smart Appliances (SAREF).

In parallel with the workshop, a set of multi-party demonstrations presented oneM2M standards in action in domains as varied as eHealth, intelligent transport, connected vehicles, energy management and smartphone management.

Delegates were surveyed at the event on the most urgent needs for smart city deployments. These were considered to be semantic interoperability across different verticals, cost effective connectivity for sensors and actuators, integration with other systems (banking, maps, open data, etc.) and cross-platform interoperability within the city. Privacy solutions as well as business models were also raised as urgent needs. It was also noted that vertical industries need to be further involved and too many initiatives make it somewhat difficult to understand the overall picture.

Presentations from the event are available on our website (at http://miniqr.com/cb3a4.r).

Meet ETSI and 3GPP at 'Critical Communications World 2016' on our joint stand

18th Annual Critical Communications World

31 May - 2 June, RAI Amsterdam

➤ **Adrian Scrase, ETSI's CTO & Head of 3GPP Mobile Competence Centre,** will be leading a keynote panel session "Are we currently trying to reinvent the wheel?" The panel will cover current and future critical communication evolution plans globally, their business cases and thoughts on the role of LTE for voice and broadband data.

➤ **Dave Chater-Lea, Vice-Chairman of 3GPP Mission Critical - Working Group SA6,** will present the group's progress in standardizing Mission Critical (MC) applications, covering the progress made to date and the roadmap for further standardization solutions from 3GPP.

ETSI Seeks Harmonization of NFV Information Modelling Across Standards Bodies and Open Source – Continued (from page 1)

First multi-organization workshop bringing the NFV community together

Participating organizations included 3GPP, ATIS, Broadband Forum, DMTF, ETSI NFV, IETF, ITU-T SG 15, MEF, OASIS/TOSCA, Open Cloud Connect, ONF, OpenDaylight, OPNFV and TM-Forum. Organizations that did not participate in this workshop are welcome to get involved in this collaboration.

Development of NFV started at ETSI in January 2013 in response to the call to action in the joint-carrier white paper published in October 2012 which introduced the NFV concept. The ETSI NFV community has grown to almost 300 organizations and has delivered key NFV specifications covering requirements, use cases, architectural framework, terminology, management and orchestration, security, performance and reliability. It has also sponsored multi-vendor proofs of concepts to encourage interoperability and growth of an open ecosystem around virtualized network functions.

Different information models and data models are being used amongst SDOs and open source communities resulting in fragmentation and complexity for implementation leading to increased cost and delaying time to market. Alignment of Information models brings clarity of definition and drives consistent open APIs that enables efficient evolvable integration across the entire ecosystem including SDN and NFV.

As a result of this workshop there is increased understanding of the challenges and opportunities in the development and adoption of various modelling approaches. And the ongoing collaboration will help to avoid fragmentation in NFV information modelling in order to deliver the services and network automation capabilities which are key benefits of NFV. There was positive feedback from many delegates on the high value of the workshop and the increased awareness of efforts in peer organizations and individual commitment by key experts will significantly boost prospects for industry alignment going forward.

"ETSI NFV ISG is pleased to foster increased collaboration among key industry bodies to enable increased automation and reduced operational costs, which service providers look for when initiating work on NFV," said Steven Wright (AT&T), Chair, ETSI NFV ISG.

The workshop was co-chaired by ETSI NFV Vice-chair Michael Brenner (ClearPath Networks) and Klaus Martiny (Deutsche Telekom), ETSI NFV Network Operator Council Vice-chair. A collaboration plan was agreed to achieve meaningful progress in addressing the challenges and opportunities identified in the workshop by the end of 2016. The first feedback from participating organizations will be in March 2016. The participating organizations will independently progress their work mindful of the collaboration milestones and regular conference calls will take place to monitor progress. When necessary another workshop will be convened to progress alignment.

Don Clarke (CableLabs), Chair of the ETSI NFV Network Operator Council said: *"It was a privilege for CableLabs to be able to host this unique event which brought together over 90 of the world's leading experts on information modelling. A delegate from a leading European operator told me that he sees this multi-SDO collaboration as being the key to unlocking the barriers to NFV adoption. The operator group will continue to be actively involved to facilitate this industry collaboration and to help ensure it delivers what the industry needs for NFV."*

3GPP Starts Work on NarrowBand IoT Standards
– Continued (from page 1)

The technology can be deployed "in-band", utilizing resource blocks within a normal LTE carrier, or in the unused resource blocks within a LTE carrier's guard-band, or "standalone" for deployments in dedicated spectrum.

NB-IoT is also particularly suitable for the re-farming of GSM channels.

"It took us some twists and turns to get there, but we have now set a clear path in Release 13 to meet the needs of the 3GPP industry to further address the promising IoT market." Dino Flore, the Chairman of 3GPP RAN said, adding: *"We entered the meeting with competing technology* proposals for standardization. After lengthy discussions we came up with a harmonized technology proposal with very broad industry support as can be seen from the number of companies supporting the approved Work Item".*

Security a challenge – and opportunity – for NFV development

Dealing with security and coordinating SDO developments are the big issues for 2016

Security in the NFV/SDN environment is one of the major challenges the industry needs to address for 2016 but it should also be seen as an enormous opportunity. It will combine analytics with the network agility enabled by NFV and SDN to improve the resilience of networks to security threats. This was one of the key messages from a range of ETSI NFV personalities speaking at the Layer 123 SDN & OpenFlow World Congress in October 2015 in Düsseldorf.

On this third anniversary of ETSI's announcement of the creation of the NFV ISG – at this same event – Don Clarke, Chair of the Network Operator Council of ETSI NFV, highlighted some of the achievements including rapid delivery of specifications, nearly 40 PoCs (Proof of Concepts) having either been completed or being in progress and that many of the other global Standards Development Organizations (SDOs) in the world are now building their specifications around the foundations provided by ETSI.

"It is incredible how far we have come in just three years. The industry must focus its efforts on what is really needed to be done to foster innovation in an open ecosystem. SDOs should also identify how to work collaboratively with open source communities," he said.

"We recognized early on that security needed to be proactively addressed in an NFV world. The NFV ISG Security Working Group is the world's leading discussion forum on this vital topic and includes security experts from government agencies as well as vendors and operators," he added.

For Diego Lopez, Chairman of ETSI NFV Technical Steering Committee (TSC), it is not just the SDOs that need to work together – the SDN and the NFV communities are developing a mutual understanding that the integration of those two concepts is increasingly important.

> **"Each community has its own challenges but many of the required solutions will come out of a joint approach**

to addressing those problems and we are seeing an acknowledgement of this as we move forward,"* he said.

Diego Lopez pointed to the more complete than ever Proof of Concept area in Düsseldorf, where demonstrations from leading operators and vendors from across the world were showing the reality of NFV progress today.

"We always wanted to follow a practical approach to NFV realization from the very beginning. It was very radical at the time but it is part of the ETSI NFV DNA and we worked hard to show that it was real from day one. PoCs show that the potential for NFV is reachable and interoperability is achievable but of course we still need specifications to make it happen fully and that is where the rest of the industry comes in,"* he said.

The NFV ISG has already published 23 specifications in less than three years – a significant achievement in such a short timescale. The first release covered NFV use cases, requirements, terminology and an architectural framework and has become the key reference for the global industry. Other specifications cover management and orchestration, security and resilience, as well as performance and portability best practice.

Release 2015 is nearing completion and currently has 35 Work Items under development, all planned for publication by Q1 2016. ETSI NFV members are also looking beyond this into other important areas – the planning of the next releases (2016 and onwards), the best approach to NFV stage 3 standardization (Open Source APIs, traditional specification, others), and strengthening of relationships with other SDOs and open source communities working in the NFV and SDN areas.

ETSI Test Description Language Launched at UCAAT Conference

The third ETSI User Conference on Advanced Automated Testing - UCAAT 2015, took place at ETSI, 20-22 October 2015. It was the place to discover Test Description Language, a new language for the specification of test descriptions and the presentation of test execution results.

With guest speakers from ETSI, the industry and academia, a tutorial to learn how to use Test Description Language, and live demonstrations to experience it in practical use, the conference also included presentations on topics related to automated testing. UCAAT has established itself as a meeting point for testing experts from industry, academia, and standardization.

The wide-scale introduction of model-based testing techniques in an industrial context faces many obstacles. There is a methodology gap between the high-level expression of what needs to be tested, such as the test purposes described in prose or Test Purpose Language (TPLan), and the complex coding of the executable tests in Testing and Test Control Notation version 3 (TTCN-3), a language recognized worldwide also developed in ETSI. Test Description Language fills that gap.

This language represents the next generation of testing languages, exploiting the advantages of model-based software engineering. Test Description Language will offer higher quality tests through better design, seamless integration of methodology and tools, better and faster test development and will be easier to review by non-testing experts.

The introduction of Test Description Language is being driven by industry.

It will be used primarily – but not exclusively – for functional testing. The first standard providing a description of the meta-model and the semantics of its elements has been published. Currently the ETSI committee in charge of writing those standards, Methods for Testing and Specification (MTS), is adding the necessary language functionality to integrate Test Description Language into test automation frameworks and to provide Open Source tool support.

To accelerate the adoption of this new language, MTS has commissioned a reference implementation of Test Description Language in order to lower the barrier to entry for both users and tool vendors in getting started with using Test Description Language. A team of experts within the technical committee will demonstrate a preview of the reference implementation which will be made publicly available in the first half of 2016.

Horizon 2020 and How ETSI Attracts New Innovative Work

Early standardization in the development of a technology or a product can be crucial to its market success. Knowing this, ETSI is involved in research programmes to facilitate the exchange of information between researchers and our standardization community. This involvement enables us to identify new areas for standardization at an early stage and can ensure that standards are in place when they are needed. In ETSI we provide support and advice to researchers in bringing their work to our standardization community in a diversity of ways.

1. From research to standards

Participation in standardization work helps researchers benefit from early exposure to the issues they face in industrial take-up of their ideas. At the same time, industry benefits from faster exploitation of research results. Research input is very relevant in early study phases, when alternative technical solutions have to be evaluated.

Opportunities for interaction between researchers and our standards committees may take different paths:

> Our more than 30,000 ETSI standards are available for free. They represent a huge and highly valuable library of the state-of-the-art of ICT, along with our white papers and brochures.

> Our all year round workshops are another entry point for research results, with their presentations, interactive live panels and networking opportunities. They provide a platform to disseminate research results and identify next steps for standardization.

> Researchers in ETSI member organizations can provide contributions to existing ETSI committees or drive the creation of new committees. Our innovation team provides support to identify the most suitable way forward.

> Validation helps ensure our standards are fit for purpose and products built on them can be interoperable.

Making use of these resources and following this path leads to a life-cycle approach of 'Integrated Standards Engineering', illustrated below.

2. ETSI support to research

We make every effort to keep up-to-date with the latest research. This triggers new standardization activities and also contributes to our ongoing work.

> We have developed close relationships with academic institutions and we take part in related events such as conferences where project results are presented

> We maintain contact with relevant European Technology Platforms, Public Private Partnerships and Joint Technology Initiatives

> On a case by case basis, we take part in relevant European Commission funded projects

> We provide advice and guidance to researchers in bringing their results to standardization

> We collaborate closely with National Standards Organizations and with Small-and Medium-sized enterprises, which are often well-placed to identify new technologies

3. Supporting the development of new technologies

We encourage our members to bring the results of their research activities to us for standardization.

We try to make it as easy as possible to start a new standardization activity in ETSI. For example:

> Our members may make a direct request to bring an activity into ETSI. Such a proposal needs the agreement of only four ETSI members.

> Our Industry Specification Groups represent an effective alternative to industry fora. They operate alongside our traditional standards-making process and produce specifications quickly and easily to encourage innovation.

> We helped to produce useful guidelines for researchers on how to build standardization into their project proposals and work plans.

4. Upcoming Workshop: "From Research To Standardization"

The upcoming ETSI workshop "From Research To Standardization" is an opportunity for researchers, industrial stakeholders and academics, especially those involved in the H2020 programme of the European Commission, to interact with ETSI. The workshop will take place on 10-11 May 2016 at ETSI.

In the ICT domain, a massive research effort is currently ongoing in the context of the H2020 programme. In addition, numerous nationally funded research efforts are under way in laboratories, at universities and in the industry across Europe. These activities create a plethora of knowledge and know-how which can enable a whole new generation of technology and will pave the way for many years to come!

Standardization activities can help bridge the gap between research and industrial development of products and services by facilitating the commercialization of research results. Depending on the maturity of a technology, there are various options – even though not always known to the research community – to transform ideas into an industrial consensus driving product development.
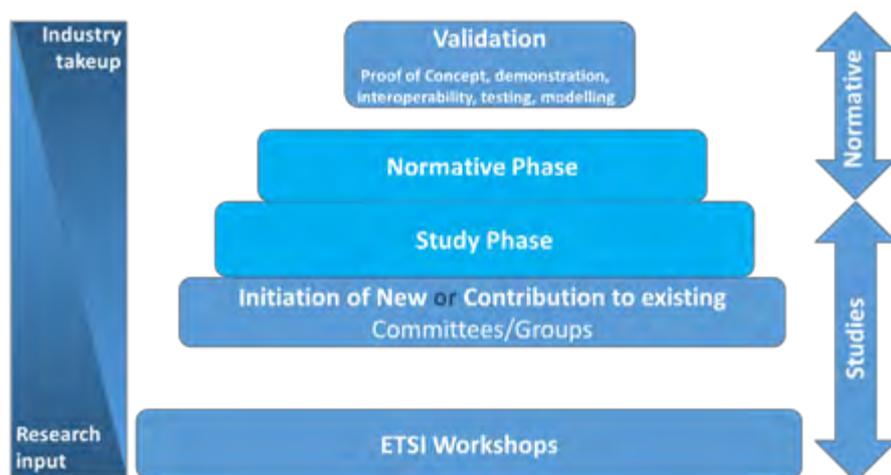
Figure 1: From Research to Standardization.

Horizon 2020 and How ETSI Attracts New Innovative Work

– Continued (from page 10)

The industrial and standards community, on the other hand, may be unaware of the wide range of technological advances and alternative solutions. Often, the link to the research community is lacking and the information flow on novel and promising technological trends is not as good as it could be.

The workshop offers a great opportunity for both stakeholder communities to come together, to discuss and to identify common interest areas.

- Industrial representatives will have first-hand access to state-of-the-art knowledge and become aware of future trends in an early stage.
- Researchers will be able to present their latest research results to industry, to jointly identify the components which are most suitable for standardization and product development activities and to agree on specific next steps.

The workshop will support researchers to disseminate and exploit their results through standardization. It serves as a platform for research consortia to inform about standardization plans and to address a wider community to find supporters and allies.

Researchers will get firsthand information from keynote speakers about the overall policy context and the relationships between research, standardization and innovation. A case study will be presented to serve as a model case.

This event is of particular interest to researchers and standardization experts, research institutes and universities, organizations and stakeholders involved in FP7 and H2020 related projects, SMEs and start-ups driving technology innovation, chipset manufacturers, device manufacturers, network infrastructure manufacturers, network operators and service providers.

If you would like help in bringing your research results to standardization or would simply like to attend the workshop, please contact our innovation team at ino@etsi.org.

Markus Mueck, Sebastiano Toffaletti & Hermann Brand, ETSI Board H2020 ad-hoc group

ETSI workshop "From Research To Standardization"

10-11 May 2016 at ETSI

The workshop offers a great opportunity for both stakeholder communities to come together, to discuss and to identify common interest areas.

If you would like help in bringing your research results to standardization or would simply like to attend the workshop, please contact our innovation team at ino@etsi.org

The Car Connectivity Consortium and ETSI Sign Co-operation Agreement

ETSI places MirrorLink® on path for adoption as an ETSI standard for connected car technology

The Car Connectivity Consortium, creators of MirrorLink®, and ETSI announced a co-operation agreement in which ETSI will formally explore adopting MirrorLink as an ETSI Technical Specification (TS). The CCC and ETSI reached the accord on 17 November 2015 at the 66th ETSI General Assembly meeting in Sophia Antipolis.

"MirrorLink's capacity to increase safety on today's roads by safely connecting smartphone apps and vehicles makes it a compelling candidate for ETSI's portfolio of standards," said Luis Jorge Romero, ETSI Director-General.

> **"MirrorLink is also in line with ETSI's mission to remain on the forefront of future technologies**

and to improve life for the next generation of world citizens."

ETSI's standards underlie many of the world's most important and widely-used technologies, such as GSM™, DECT™, smart cards and electronic signatures – all of which have helped revolutionize modern life. In the field of transport/automotive and connected cars, ETSI has brought together stakeholders from the car industry in its Intelligent Transport Systems (ITS) Technical Committee. This group is leading the drive to achieve global standards for Cooperative ITS, which offers enormous potential through vehicle-to-vehicle and vehicle-to-roadside communication.

MirrorLink is the most ingenious way to bring smartphone content to the car dashboard. Huge icons make apps easy to use and smart technology knows if the car is parked or in motion. Designed for maximum interoperability between a wide range of smartphones and cars, MirrorLink is the only OS-and OEM-agnostic technology for car-smartphone connectivity where no single entity has a controlling stake.

"The CCC is very pleased to enter a co-operation agreement with ETSI because it serves as important validation for MirrorLink's wide-reaching car tech capabilities," said Alan Ewing, President and Executive Director of the CCC. *"With millions of MirrorLink-enabled handsets and vehicles already in use on European roads alone, the public has demonstrated not only demand for intuitive connected car technologies, but an eagerness to do their part in reducing distracted driving."*

The Importance of Security in Progressively Complex Communications

The increasingly rapid evolution and growth in the complexity of new systems and networks, coupled with the sophistication of changing threats and the presence of intrinsic vulnerabilities, present demanding challenges for maintaining the security of ICT (Information and Communications Technology) systems and networks.

To minimize exposure to such risks, the most important starting point is to build security in from the beginning or "security by design" when designing new architectures, not to "bolt it on" later as an optional feature. There are plenty of examples out there of what can happen when security isn't considered as an important issue right from the beginning, examples include cars being taken over due to insufficient security control and aircraft where the passenger internet system is incorrectly connected to the main control system of the aircraft.

Over recent years potential and real threats to ICT have become more frequent and as a result, security has had to advance quickly, with areas such as cybersecurity, cloud, mobile, and the Internet of Things (IoT) creating tighter risk requirements. But it is still lagging behind the rapidly growing rollout of new services and applications which depend on a culture of openness and the sharing of information.

The IoT describes a world in which everyday objects are connected to a network so that data can be shared. This brings a new set of security challenges due to the diverse range of technologies involved and where and how these are used.

We are moving towards a world that will soon be dominated by SDN and NFV, but this will be very much software driven so there will undoubtedly be many more challenges in the future. But as well as examples of where things have gone wrong there are also many examples of systems that have been designed correctly right from the start. For example GSM, which was designed by ETSI over 25 years ago, is still working perfectly today in spite of ongoing external security threats. The key is to design a system that is suitable for both business purposes and the technical support of the security system.

Awareness of the need to protect both the privacy of individuals and their data is increasing with frequent largescale media exposure of insecure organizations. The continuous growth of criminal activities and the need to anticipate the associated risks, is proving critical for a sustainable infrastructure.

This is why security standards are essential for the management of such threats to ensure interoperability among systems and networks, compliance with legislation and adequate levels of security. These standards provide the means for protecting the user as well as creating a more secure and profitable environment for businesses, organizations, governments and individuals.

ETSI has a comprehensive range of security standardization work underway, and follows an approach of building in security into each and every technology standardized: security by design, or by default. ETSI TC Cyber is an oversight transversal committee whereas ETSI technical bodies deal directly with security in everything from mobile, radios, security, algorithms, ePassports and digital signatures, right to the extreme lengths of quantum cryptography and quantum computing. An ETSI White Paper is updated regularly to provide an overview of all of ETSI's security standardization. Our Security Week event, held once a year, brings together the world's leading security standardization experts to exchange information and best practices in order to keep ahead of constantly advancing security threats.

If ETSI members are serious about their communications business, then they should take security standardization seriously and participate in our committees and events.

Charles Brookson,
Chair of ETSI TC Cyber

ETSI Workshop Confirms Need to Accelerate on Quantum-Safe Cryptography Standards

The third ETSI/IQC workshop, organized by ETSI and the Institute for Quantum Computing, Waterloo, Canada, was hosted by SK Telecom in Seoul, Korea, from 5 to 7 October 2015. The event presented the most recent requirements from industry and administrations, and potential solutions stemming from the latest research. It confirmed that there have been advances in building large-scale quantum computers, making it even more urgent to work on quantum-safe cryptography. The recent NSA announcement about transition to quantum resistant algorithms[1] is a further acknowledgement of the issue raised by the future era of quantum computers.

As cyber technologies increasingly pervade all aspects of our lives, cybersecurity is a growing and fundamental part of the safety and security of individuals, organizations

and society. However for the advent of large-scale quantum computation to be a positive milestone in human history,

> we must first make our cryptographic infrastructure secure against all future attacks,

whether quantum or traditional. Quantum-safe cryptography is about protecting against emerging threats and comprises "post-quantum" cryptography as well as quantum cryptography, taking into account attacks by quantum computers as well as traditional ones.

The workshop was a good testimonial of the advances of research in quantum computing technologies. A quantum safe infrastructure needs that quantum key distribution be implemented securely and the workshop addressed this topic as well. The ETSI Quantum Key

Distribution Industry Specification Group was created to work on this specific component of quantum cryptography. A session was also dedicated to the status of quantum research in Europe, Canada, China and Korea, and there was a closing industry panel discussion.

Advice for industry and government included asking for quantum-safe options on vendor roadmaps, making quantum risk management a part of cybersecurity roadmaps, requesting standards for the quantum-safe tools needed, where helpful, and requesting information or studies needed to make wise decisions going forward. Manufacturers and developers are urged to contribute to standards development.

ETSI has anticipated the quantum era with the creation of the Quantum Key Distribution ISG, and, lately, the Quantum-Safe Cryptography ISG which is collaborating closely with other stakeholders.

[1] https://www.nsa.gov/ia/programs/suiteb_cryptography/

ETSI Enables Chain of Trust for Digital Signatures

First European Standard supporting European eIDAS regulation

ETSI has published the first of a series of European Standards to support the European Regulation on electronic identification and trust services for electronic transactions in the internal market, or eIDAS (Regulation (EU) 910/2014).

EN 319 403 (at http://miniqr.com/8de1d.r), developed by ETSI's Electronic Signatures and Infrastructures (ESI) technical committee, enables conformity assessment of trust service providers.

More and more organizations today use digital signatures, stamps or certificates to authenticate their documents, whether they are banks, companies or government bodies. In today's digital world, digital signature makes document authentication easier, greener and more secure.

ETSI enables digital signature deployment through the work of its technical committee ESI, but also through interoperability events to cross-validate digital signatures in the formats standardized by ETSI, namely CAdES, XAdES and PAdES (based respectively on Cryptographic Message Syntax, Extended Mark-up Language and Portable Document Format) and Associated Signature Containers (ASiC).

EN 319 403 is the first standard of its kind defining requirements specific to the conformity assessment and audit of trust service providers, thus strengthening the trust chain of digital signatures. It specifies requirements for the competence, consistent operation and impartiality of conformity assessment bodies auditing and certifying conformity of trust service providers (TSPs) and the trust services they provide.

The EN supports the audit requirements of the eIDAS Regulation.

> The Regulation requires qualified Trust Service Providers to be audited by conformity assessment bodies after 1st July 2016.

Riccardo Genghini, ETSI TC ESI chairman declares: *"The Regulation recognizes the normative relevance of technical standards and provides a balanced coordination between legal and technical norms that has been praised even by The Economist (at http://miniqr.com/economist.r), normally quite critical of EU "overregulation". The extended and pervasive auditing of Qualified Trust*

Service Providers will create a transparent chain of trust that will trigger several new digital services which will thrive cross border in Europe and beyond".

To allow business stakeholders to more easily implement and use products and services based on digital signatures, as well as to facilitate mutual recognition and cross-border interoperability of signatures, ETSI TC ESI has released Technical Report TR 119 000 (at http://miniqr.com/c2f85.r) describing the general structure for digital signature standardization and outlining existing and potential standards for such signatures.

Nineteen related European Standards are currently undergoing approval at ETSI. They cover general policy requirements for trust service providers, policy and security requirements for trust service providers issuing certificates, policy and security requirements for trust service providers issuing time-stamps, certificate and time-stamping profiles and digital signature formats.

Open Source and Standards Work Together at ETSI

At the ETSI summit on Open Source and Standardization, which took place in Sophia Antipolis on 19 November 2015, Mr. Luis Jorge Romero, ETSI Director General, introduced the event with these words: *"Clichés tend to perceive the world of standards as the middle aged black tie conservative people in competition with young hacker-like free spirit open source developers. Well, those times are long gone."*

The summit brought together members of the Open Source community along with standardization bodies who exchanged refreshing and stimulating ideas about the interaction between two communities who are already working together but need to do more. W3C, IETF, ECMA, Open Forum Europe (OFE), OASIS, Open Grid Forum (OGF), Open Networking Forum (ONF) or European Broadcasting Union (EBU) were among the speakers of the day.

The afternoon panel led to a discussion with the audience and included ULE Alliance, Java Community Process (JCP), Open Air Interface (OAI), Open Software Alliance (OSA), Open Mobile Alliance (OMA), the ETSI NFV Industry

Specification Group, the oneM2M partnership project, of which ETSI is a founding member, and the Fraunhofer Institute for Integrated Circuits.

Speakers at the event recognized that Open Source software and standards were not competing but complementary. Open Source can bring innovation, fast development and the involvement of a committed global community and many companies have found a solid business case to develop and use Open Source software. On the other hand, according to the speakers, standards bring long-term stability, wide consensus and a cohesive view of large and complex systems, together with ensuring interoperability, confidence in products and services and offering economies of scale.

Today, as virtualization and cloud technology are shaping the next generation of network systems, it is increasingly necessary to work with Open Source software. Open Source can be used to develop reference implementations for evaluating specifications and for testing interoperability. In ETSI, the Centre

for Testing and Interoperability uses a state of the art open source tool chain to assist in the development of base standards and test standards. Many Open Source projects have been set up to develop implementations of ETSI specifications. Software development techniques are increasingly being used in the standards community and in some standards.

Understanding Open Source licensing is important when working with Open Source software and ETSI will organize more focused workshops on this and other open source topics in the year to come.

Presentations from the summit are freely available on our website (at http://miniqr.com/2e1cd.r).

Multi-Vendor Interoperability Event Validates oneM2M Standard for IoT

oneM2M, the global standards initiative for Machine to Machine (M2M) and the Internet of Things (IoT), held an interoperability testing event from 14 to 16 September 2015. This was an important milestone to validate interoperability and end-to-end functionality of the oneM2M Release 1 Specifications.

oneM2M partners ETSI and TTA (Telecommunications Technology Association of Korea) co-hosted the event at the ETSI headquarters, in Sophia-Antipolis, France, with support from the European Commission.

29 organizations and companies came together to test their equipment against each other. The result was a resounding success: the participants successfully demonstrated interoperability of their oneM2M implementations across a number of different use cases. Participants also fed back clarifications and enhancements to the oneM2M specifications – another important outcome.

Dr. Enrico Scarrone of Telecom Italia, vice-chairman of oneM2M's Steering Committee, stated: *"With this successful event attracting so many companies, we have demonstrated multi-vendor interoperability which is so important for IoT service providers."*

Dr. Omar Elloumi of Alcatel Lucent, oneM2M's Technical Plenary Chair explains: *"The industry is juggling between several IoT technologies, trying to guess which one will dominate. oneM2M doesn't aim to pick winners. Our Release 2 specifications, currently under development, provide an interworking framework across IoT protocols, including OMA's LightWeight M2M, AllSeen Alliance's AllJoyn and the Open Interconnect Consortium (OIC), preserving the investments already made in each. This is the 'missing link' which will help accelerate IoT deployments."*

> **"oneM2M Release 2 specifications are the missing link which will help accelerate IoT deployment"**

Prof. JaeSeung Song of Korea Electronics Technology Institute (KETI), oneM2M's Test Working Group Chair, outlined plans for future events: *"With high demand from many vendors worldwide, oneM2M plans to hold two interoperability events per year. The next interoperability event will be held May 2016 in Korea, also co-hosted by TTA and ETSI."*

Participants at this first oneM2M Interoperability Test Event included:

Actility, ANRITSU, Cisco Systems, eDevice, EGM – eglobalmarket, ETRI - Electronics and Telecommunications Research Institute, Fraunhofer FOKUS, FSCOM, HandySoft, HERIT Corporation, HP, Huawei Technologies, iconectiv, III - Institute for Information Industry, InterDigital Communications, KEPCO - Korea Electric Power Corporation, KETI - Korea Electronics Technology Institute, KT, LAAS-CNRS, Modacom, LG U+, nTels, NTT - Nippon Telegraph and Telephone Corp., Qualcomm Germany, Radisys, Ricoh, Sierra Telecom, TTA - Telecommunications Technology Association, TTC - Telecommunications Technology Committee.

Book your place now on the next oneM2M Interop Event!

The next oneM2M interop event is planned for 10-13 May 2016, and will take place at TTA, in Seongnam-city, South Korea. This event is also co-organized by TTA and ETSI. Visit the ETSI or the oneM2M websites for further details and to book your place.

ETSI Launches New Standards Group for Next Generation UltraHD TV

ETSI new Industry Specification Group on intelligent Compound Content Management (CCM) met for their kick off meeting on 16 December at ETSI in Sophia Antipolis, France. The intelligent Compound Content Management ISG is working on a standardized solution to define a scalable and flexible decoding system for consumer electronics devices from UltraHD televisions to smart phones. This solution simultaneously meets the needs of existing and next generation receivers and set-top boxes. The founding members of the group are BT Group Plc, Dolby Laboratories Inc, STMicroelectronics and Telefonica S.A.

"With this new standardization work, ETSI will offer consumer equipment manufacturers a single and global decoder for all devices, without compromising image quality. This will save time and money for content distribution and consumers will benefit from the latest innovative technologies." says David Holliday, chairman of ETSI CCM ISG.

Market drivers for the next generation of Ultra-HD displays and equipment include the addition of HDR (High Dynamic Range), a technique used to reproduce both darker and brighter, more life-like images, and WCG (Wider Colour Gamut), extending the colour range being displayed on a device.

New HDR/WCG production techniques have recently been introduced for film and broadcast content creation thus allowing greater creative freedom and more realistic images.

Yet, legacy receivers, including tablets, will comprise the majority of the receiver installed base. To ensure a smooth transition between today's television standards and tomorrow's, a new transmission system should offer backwards compatibility with today's television standards whilst also providing the full quality for the next generation HDR/WCG televisions. It is necessary to find a solution where no compromise is needed either for today's images or for future HDR images, thereby maintaining the

highest levels of creative intent. A Compound Content transmission system would allow two or more qualities or grades of content to be sent simultaneously and permits the intelligent reconstruction of one or more of these qualities or grades in the receiver without compromising the intent of the other.

Any HDR/WCG transmission solution must take into account the diverse needs of the content creation industry, the ongoing work on HDR/WCG production technologies, the complexity of any solution in silicon and the quality of the signals to be delivered through DVB or ATSC based systems to both legacy devices and HDR/WCG devices.

Participation in the intelligent Compound Content Management 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.

Overview of ETSI Cloud Standards Coordination

E. Darmois, CSC project coordinator

There are many ways to be an effective actor in the standardization landscape, not only writing standards. In particular, given the complexity of standardization ecosystems, it is more and more useful to analyse these ecosystems and suggest ways to improve their relevance. This is the role that ETSI has been playing in the Cloud Standards Coordination (CSC) project in the last years, with a focus on Cloud Computing.

Cloud Computing is increasingly used as the platform for ICT infrastructure provisioning, application and systems development, and to support a wide range of core services and applications for end users, businesses and organizations. Cloud Computing is drastically changing the way ICT is provided and used. However, many challenges remain to be tackled. Concerns such as security, vendor lock-in, interoperability and accessibility are examples of issues that need to be addressed.

Standards and certification schemes play an important role as they can increase the confidence of markets in Cloud Computing as long as they are addressing and supporting the real concerns of customers and users as well as providers, so that they can consider Cloud Computing with the same level of reliability, trust and maturity as "traditional" ICT.

Phase 1:
exploring the standards landscape

ETSI and the European Commission launched Cloud Standards Coordination (Phase 1) in 2013 and primarily addressed the Cloud Computing standards roadmap. The principle objective of CSC was to identify a detailed map of the standards required to support a series of policy objectives defined by the European Commission, in particular in critical areas such as security, interoperability, data portability and reversibility. In December 2013 the results were publicly presented in a workshop organized by the European Commission (EC), and published as the CSC Final Report (at http://csc.etsi.org/phase1/CSC_report.html). This report provided a "snapshot" of the cloud computing standardization landscape at the end of 2013. Important standards gaps were identified such as in the domains of interoperability, security, privacy, service level agreements and regulation, legal and governance aspects.

Phase 2:
assessing the evolution of standards

In February 2015, ETSI launched phase 2 of CSC for the European Commission to address some issues and specific aspects left untouched after CSC Phase 1. In particular, CSC Phase 2 is centered around the point of view of the Cloud Computing users (e.g. SMEs, administrations) whereas CSC Phase 1 was more centered on the cloud service providers. Four major activities have been selected, each resulting in an ETSI Special Report.

A User's Survey

CSC Phase 2 better takes into account the needs of Cloud Computing customers and their Cloud related requirements and priorities. It further assesses the maturity of Cloud Computing standards and evaluates how standards can support Cloud Computing customers' priorities. To support these objectives, CSC Phase 2 has created a survey to collect feedback from the Cloud Computing community in terms of needs, benefits, challenges and areas of concern regarding the adoption of Cloud Computing. The survey was also to evaluate the perceived maturity of Cloud Computing standards as well as to understand the interest and requirements of cloud computing stakeholders regarding certification. The main findings and lessons learned from this survey are used in the other activities of CSC Phase 2.

Cloud Computing Standards and Open Source

The work done in CSC Phase 1 has identified Open Source as an important contributing element to Cloud Computing and outlined the need to understand the relationship between Open Source and standards, but did not address this specifically. The work done in CSC Phase 2 consists in defining how standards and Open Source are interworking in the field of Cloud Computing, outlining the Open Source results of interest for standardization, and making some recommendations.

Security and Interoperability

Security was one of the points of attention of CSC Phase 1. Though the availability of Cloud Computing standards related to security and their level of maturity was considered to be relatively good, security and privacy were seen as major potential showstoppers for customer involvement in Cloud Computing. The work of CSC Phase 2 was to outline how standards and certification can support some typical customer and end-user scenarios, and which ones are available to this extent.

Standards Maturity Assessment

The Cloud Standards Coordination Phase 1 report provided a list of available standards based on a segmentation of the Cloud Computing Service life-cycle by activities. This approach was also used in CSC Phase 2, so that progress in the Cloud Computing landscape could be measured almost two years after Phase 1. The list of relevant Cloud Computing Standards Setting Organizations - and their related standards and documents - has been reassessed, showing both maturing areas and remaining gaps.

Where to find CSC

All documents related to CSC - in particular the four Special Reports produced by CSC Phase 2 - can be found on the CSC web site: http://csc.etsi.org

The results of CSC have been presented in a large number of events in the Cloud Computing community all over 2015. The final results of CSC Phase 2 were presented in Brussels (at http://csc.etsi.org/phase2/FinalPresentation.html) on 28 January 2016.

ETSI 2016 EVENTS CALENDAR - What's on?

01-31 March	e-Signature Validation Remote Plugtests	Remote
08-09 March	5G Observatory	Paris, FR
08-10 March	ETSI ITS workshop	Sophia Antipolis, FR
08-11 March	MPLS + SDN + NFV World	Paris, FR
10 March	Scalable Radio Virtual Machine and Security for multi-RAT Reconfigurable Systems	Rennes, FR
10-11 March	Fog Networking Conference	Paris, FR
14-18 March	NG112 Emergency Communications Plugtest	Sophia Antipolis, FR
21-22 March	ETSI Workshop on Internet of Things in the Smart Home	Sophia Antipolis, FR
19-22 April	NFV World Congress 2016	San Jose, USA
21 April	ETSI summit on 5G: From Myth to Reality	Sophia Antipolis, FR
10-11 May	ETSI workshop, From Research To Standardization	Sophia Antipolis, FR
10-13 May	oneM2M Interop 2 workshop	Seongnam-City, KR
31 May-02 June	Critical Communications World	Amsterdam, NL
31 May-02 June	Networks Virtualization & SDN World	Madrid, ES
01-30 June	ASiC Electronic Remote Plugtests	Remote
13-20 June	ETSI Security week	Sophia Antipolis, FR
27-30 June	European Conference on Networks and Communications	Athens, GR
27June-08 July	Small Cell LTE Plugfest	Naples, IT
28 June	ETSI workshop, Open source and standards-legal aspects	Sophia Antipolis, FR
28-30 June	5G World	London, UK
28-30 June	Connected Cars	London, UK
13 July	World Smart City Forum	Singapore, SG
20-22 September	MEC World Congress	Munich, DE

Please visit the events section of our website for further details

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