

building the future



work programme

2015 - 2016



ETSI's Vision of a Connected World



ETSI is a producer of globally applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and Internet technologies. The high quality of our work and our open approach to standardisation has seen our influence extend from our European roots to impact the world.

ETSI is officially recognised by the European Union as a European Standards Organisation. Our activities are driven by time to market and our standards help ensure the free movement of goods within the single European market, allowing enterprises in the EU to be more competitive.

ETSI is a not-for-profit organisation with more than 800 member organisations worldwide, drawn from 64 countries and five continents. Members include some of the world's leading companies and national administrations working alongside R&D organisations, smaller businesses and innovative start-ups.

ETSI is at the forefront of emerging technologies. We are building close relationships with research bodies and addressing the technical issues that will drive the economy of the future and improve life for the next generation.

ETSI is a world-renowned organisation with a solid reputation for technical excellence. We make our expertise available to our members and customers through a range of services for growing ideas and enabling technology.

Our 'clusters' (above) provide a simplified, yet comprehensive, way of identifying our different areas of expertise based on business relevance or application domain rather than our committee structure. Each cluster represents a major component of the global ICT architecture and brings together the work of those Technical Committees and other groups which share a common technological scope and vision. It is this joint scope and vision that gives each cluster its own identity; collectively the clusters represent the totality of ETSI's work, and demonstrate the way that technologies are converging into a connected world.

Our standards-making process is based on consensus and openness. The choice of what to standardise, the timing and resourcing of the task, and the approval of the final drafts are all decisions made by our members. So the standards we produce truly respond to the needs of the ICT industry, as represented by our members. Join us – and have your say in the future shape of our industry.



Building the Future

Work Programme 2015-2016



It becomes increasingly difficult to provide an annual round-up of ETSI's work – not because the technologies we address are becoming more complex (though they are), but because the range of what we do expands considerably every year.

We are still standardising the technologies which first earned us our reputation as a leader on the global standardisation stage

– mobile communications, security, cordless telecommunications, broadcasting, networking and so on – but nowadays we are standardising futuristic aspects of these technologies.

So, for example, working as a partner in the Third Generation Partnership Project (3GPP™), we continue to develop 3G and 4G mobile communications. But we are already anticipating the introduction of 5G in 2020 by enhancing the core network. We are developing standards in fields such as Software-Defined Networking, Network Functions Virtualisation and autonomic network management, and preparatory standardisation which will benefit 5G is underway in our new Industry Specification Groups (ISGs) on Millimetre Wave Transmission and Mobile-Edge Computing, and in our work on shared spectrum management techniques through Reconfigurable Radio Systems.

The Internet of Things (IoT) and Machine-to-Machine (M2M) communications are ushering in a new world with exciting and innovative services, while at the same time offering unprecedented business opportunities. As one of the founding partners in the global oneM2M partnership, we are helping to ensure the most efficient worldwide deployment of M2M systems. Meanwhile in ETSI we have begun to standardise the communications of smart appliances, and we are starting new work on aspects of smart cities.

However, the more devices are connected together, the greater the potential risk. Security is an important element in all our standardisation activities but it is key in the IoT. While we continue to develop standards for smart cards, security algorithms, electronic signatures and lawful interception, we have also set up a new committee, TC CYBER, to combat the growing threat of cyber-attack to individuals, our economy and our infrastructures which comes with our growing dependency on the Internet. We are also looking at quantum-safe cryptography and, among other things, our ISG on Quantum Key Distribution is devising protection against Trojan horse attacks.

We are helping to ensure that Information and Communications Technologies (ICT) make the world a better, safer place. We are standardising technologies that enhance the quality of living such as digital broadcasting, content delivery and video over powerlines.

We continue to address the human factors aspects of ICT, to ensure that they remain accessible to all in our society, including the old, the young and those with other special needs. For example, we are starting to prepare for a future when people who have grown up in

a digital age may one day, through the natural aging process, find themselves technologically disenfranchised unless we take action now.

We are developing the standards needed to deploy Co-operative Intelligent Transport Systems, with all they offer in terms of road safety, reduced energy consumption and efficiency. At the same time, we continue to provide standards for other aspects of personal safety such as emergency calling and alerting and maritime distress beacons and, in co-operation with 3GPP, we are pursuing the development of LTE™ for critical communications.

Our standards can also protect us from the potentially damaging effects of progress. We are working to minimise the eco-environmental impact of ICT equipment. We monitor and address speech and multimedia transmission, both to improve reception and to prevent acoustic injury, such as to agents working in call centres.

The new Radio Equipment Directive (RED) will fully replace the Radio & Telecommunication Terminal Equipment (R&TTE) Directive in June 2016, when the R&TTE Directive will be repealed. Our Harmonised Standards allow manufacturers to benefit from the presumption of conformity with the R&TTE Directive. Since the scope of the RED is broader than the R&TTE Directive, in 2015 we will intensify the revision of our existing Harmonised Standards and the creation of new ones for equipment which was not previously covered, to ensure a smooth transition to the RED in support of the European Single Market.

In our connected world, interoperability is a vital factor in commercial success. So our standards are tested rigorously to ensure they provide a solid basis for the implementation of robust and interoperable products. In 2015, we plan to launch a new testing language, Test Description Language.

We are constantly expanding our links with research and innovation communities to identify new technologies for standardisation, and so the list goes on...



The following pages describe our work in numerous diverse areas. What unites it all though is the fact that, together, it is enabling a new technological world with boundless potential. This Work Programme thus offers an open door on what the future has to offer. Full details of all upcoming standards and specifications can be found at: <http://webapp.etsi.org/workprogram>.

Dirk Weiler

Chairman of the Board



New Beginnings

We are constantly looking for new ways to extend our activities and to keep up to date with the latest developments in Information and Communications Technologies (ICT). In this way we are able to provide our members with the standards they need to develop their businesses with innovative services and equipment.

By becoming involved in the development of a new technology, we are able to identify new areas for standardisation at an early stage. Standardisation contributes to customer confidence and enables interoperability. It can thus be critical to the market success of new technologies.

Industry Specification Groups

Our Industry Specification Groups (ISGs) operate alongside our traditional standards development process, producing specifications in pivotal areas. They provide a flexible platform to bring together key stakeholders, including non-members of ETSI, to steer the development of a technology and its commercialisation. Some ISGs focus on a specific activity at the cutting edge of technological research and development. Others address business opportunities in new market segments. All ISGs enjoy enthusiastic support from industry; they offer a quick and easy alternative to the creation of industry fora.

For example, our ISG on Network Functions Virtualisation (ISG NFV) attracts participation from over 270 companies from all over the world, including 37 major network operators. In 2015, this group is embarking on a second phase, with an ambitious programme of 28 new specifications under development.

Security is going to be critical in the development of future technologies which are based on interconnectivity. Earlier in 2015, we set up an ISG on Quantum-Safe Cryptography to address cryptographic algorithms which cannot be broken by either the most powerful conventional or by future quantum computers. Our ISG on Quantum Key Distribution is working to protect users from eavesdroppers through the use of quantum mechanical effects, and our Information Security Indicators ISG expects to publish new guidelines for testing the effectiveness of security risk detection capabilities.

Our new ISG on IPv6 Integration is addressing the transition from IPv4 to IPv6 in the context of current industry trends such as the Internet of Things (IoT), Cloud computing and 5G. Other new groups getting started in 2015 include Mobile-Edge Computing and Millimetre Wave Transmission, two new technologies which, among other things, could play a key role in 5G communications.

We also have ISGs working on operational eco-efficient ICT, localisation standards and a software solution for exchangeable Conditional Access/Digital Rights Management.

In Touch with R&D

In 2015 we will continue to participate in relevant European Commission funded projects. This involvement can contribute to our ongoing work, and is one way in which we can identify possible technologies for standardisation early in their development. In Project ANTILOPE, for example, we will help to address the adoption and take-up of standards and profiles for eHealth interoperability.



As a partner in the Electronic Simple European Networked Services (e-SENS) consortium, an EU co-funded Large Scale Pilot project, we will continue to work to make cross-border government services a reality, enabling the mobility of citizens and businesses. We will also maintain our informal liaison with other relevant European projects including eCODEX, with a view to improving the cross-border exchange of information in legal proceedings, and STORK 2.0, which is contributing to the realisation of a single European electronic identification and authentication area.

Recognising that Horizon 2020, the EU research and innovation funding programme, is a potential source of new technologies which could be standardised in ETSI, we work closely with relevant projects. We are an Associate Member of the 5G Infrastructure Public Private Partnership (5G PPP).

We also offer advice on how to exploit research results through standardisation.

Workshops

Our varied programme of workshops helps us to generate early consensus, to kick-start new standardisation activities and to fertilise our ongoing technical work. These events also serve as open platforms for researchers and academia to present their work and enter a dialogue with industry and other interested stakeholders. Highlights of the calendar in 2015 include globally recognised events such as our Intelligent Transport Systems workshop and, in December, the sixth annual Machine-to-Machine (M2M) communications workshop which will incorporate a second oneM2M Showcase.

In June 2015 we will extend our highly successful annual Security Workshop into a full Security Week. As well as additional time for networking, this will include a high-level workshop, followed by more focused thematic streams and opportunities for non-members to attend open meetings of our security-related committees. We expect this event to trigger new standardisation work for us.

Other key events in 2015 will include workshops on Telecommunication Quality beyond 2015, Open Source software and standardisation, M2M communications and the IoT, as well as the ETSI International User Conference on Advanced Automated Testing (UCAAT). The Third Generation Partnership Project (3GPP™) will also be holding a ground-breaking workshop on 5G technology. In 2016 we plan to hold workshops on new challenges in the standardisation process, such as the relationship between standardisation and research, and new innovative waveforms for radio systems.



Bringing the Power of ICT to People on the Move

Information and Communication Technologies are revolutionising the transport sector, increasing efficiency, reliability and safety and reducing energy consumption. We support road, railways, aviation and maritime transportation with activities which are carried out by key industry players and therefore reflect true market demand.



Intelligent Transport Systems (ITS)

Our ITS committee (TC ITS) is leading the drive to achieve global standards for Co-operative ITS, which offers enormous potential through vehicle-to-vehicle and vehicle-to-roadside communication. Applications include road safety, traffic control, fleet and freight management and location-based services, providing driver assistance and hazard warnings and supporting emergency services.

We are working in co-operation with the European Commission (EC) and the European Committee for Standardisation (CEN), as well as the automotive industry and road infrastructure operators. Activities are also being co-ordinated with other standardisation bodies to ensure the alignment of ITS deployment in different regions.

In 2015 we will fine tune our Release 1 standards, taking account of feedback received.

At the same time, we are beginning to develop Release 2. This will cover new features and functionalities anticipated in future Co-operative ITS. In particular, it will include specifications to protect vulnerable road users such as cyclists and motor cycle riders, and for Co-operative Adaptive Cruise Control. It will also address platooning, a practice which is expected to save both fuel and space on the roads. We have begun work on the Co-operative Observation Service, whereby sensor information is shared between road users to, in effect, extend a driver's field of vision, and we have initiated pre-studies into relevant use cases. We are addressing cross layer Decentralised Congestion Control for the management of Co-operative ITS.

We are also developing conformance tests, which are crucial for the commercial deployment of Co-operative ITS.

We are revising our Technical Specification (TS) on mitigation techniques to avoid interference between European CEN Dedicated Short Range Communication equipment and ITS operating in the 5 GHz frequency range.

We continue to address the spectrum requirements of Release 2.



Automotive Radar

In the Ultra Wideband automotive radar area, we are revising our Harmonised Standards for ground based vehicular radar in the 76 - 77 GHz range and high resolution automotive radar in the 77 - 81 GHz range in the light of the EC MOSARIM project on radar interference mitigation and the amended regulatory framework. We are developing a new European Standard (EN) on the use of helicopter radar to prevent accidents.

Aviation

Work in response to EC mandate M/524 in support of the Single European Sky (SES) Air Traffic Management (ATM) Master Plan was discontinued in 2014 in the light of the EC's restructuring of the SES and European Aviation Safety Agency regulations. However, the EC will still require our Community Specifications, at least temporarily. Our Aeronautics committee (TC AERO) is therefore updating its two-part EN on the Advanced Surface Movement Guidance and Control System (A-SMGCS). We await clarification from the EC as to whether or not we should begin new work in support of M/524.

We are extending our EN on the A-SMGCS to cover multilateration equipment and we will revise our ENs for the ground-based VHF Digital Link Modes 2 and 4 radio transceivers for the aeronautical mobile service, in support of EC Mandate M/405 on ATM systems.

Railways

Our Railway Telecommunications committee (TC RT) is addressing interference issues with public systems. In 2015 we will update our TS on receiver parameters, specifically to deal with the introduction of 2W mobile handheld devices. We are developing a specification to incorporate Internet Protocol into the core network and interfaces.

We expect to complete a feasibility study into the use of GSM-R (GSM™ on railways) radio performance enhancements and resource optimisation to improve system capacity, spectrum efficiency and the robustness of the radio link. We are developing a new TS on the General Packet Radio Service (GPRS)/Enhanced GPRS features needed to operate the European Train Control System. We will begin work on a System Reference document on the spectrum needs for the roll-out of the Future Rail Mobile Communications System. We will also address the spectrum needs of urban rail, considering the sharing of ITS spectrum, and we will look into the possible adaptation of ITS standards and specifications for urban rail systems.

Maritime

We are revising the Harmonised Standard on fixed and portable VHF equipment in the 121,5 - 123,1 MHz band for search and rescue. We are updating our EN on Digital Selective Calling equipment and developing a Harmonised Standard on maritime broadband radio links for ships and fixed installations engaged in off-shore activities.

Satellite Support

In 2015 our Satellite Earth Stations and Systems committee (TC SES) expects to publish a new EN on Earth Stations on Mobile Platforms (ESOMPs) operating with non-geostationary satellites in the Ka band. This will facilitate the introduction of new equipment for satellite broadband access on board aircraft and vessels. We are also developing standards aimed at adding new antenna types for ESOMPs operating with geosynchronous orbit satellite systems.

Integrating Objects to Create New Networked Services

An ever increasing number of everyday machines and objects are now embedded with sensors or actuators and have the ability to communicate over the Internet. Collectively they make up the 'Internet of Things' (IoT). The IoT draws together various technologies such as Machine-to-Machine (M2M) service platforms and wireless sensor networks. Potential applications and services include smart devices, smart cities, smart grids, the connected car, eHealth, home automation and energy management, public safety and remote industrial process control.

Machine-to-Machine Communications

It is widely acknowledged that the IoT and M2M communications will change the way we live and work through new and innovative services, while at the same time offering unprecedented new business opportunities. But the development of the IoT is complicated by the use of different platforms, proprietary software, protocols and networking options, and the complexity of seamlessly connecting all the disparate devices which together make up the IoT is hampering its growth.

ETSI and oneM2M

ETSI is one of the founding partners in oneM2M, the global partnership which was launched to ensure the most efficient worldwide deployment of M2M communications systems. oneM2M brings together 14 partners including eight of the world's leading Information and Communications Technologies Standards Development Organisations, as well as representatives of different industry sectors.



The first oneM2M release, published in January 2015, provides a globally standardised interface so that different devices can be connected, at a level above that of the individual device or user and irrespective of the underlying network. This interface includes functionality for device management, subscription, notification, location and much more. Standardisation will also reduce time-to-market for new devices and applications.

In 2015 oneM2M will complete its collection of the requirements for its second Release of global standards for M2M deployment. Release 2 will add new functionality, including improvements to security, further development of abstraction and semantics, interworking and enhancements specific to some of the industry sectors.

oneM2M has also begun to develop interoperability and conformance specifications. A test event is planned for September 2015 and discussions on a certification programme are well underway.

Following the highly successful Showcase held at ETSI headquarters in December 2014, similar events will take place in Japan and the US, and again at ETSI in December 2015, offering live practical demonstrations of the capabilities of the first release of oneM2M specifications.

Further information at www.oneM2M.org

Our own Smart M2M Communications committee (TC SmartM2M) addresses services and applications, including aspects of the IoT. We continue to update our existing specifications on M2M service platform interfaces on a regular basis.

Smart appliances

In 2015 we will look in particular at the use of the service platform to interface with smart appliances, allowing interoperability of applications and 'plug and play' connectivity. In the future, domestic and industrial appliances will be highly intelligent, networked smart devices. To ensure such systems are commercially successful and widely adopted, it must be possible to add new appliances from different vendors. These systems will also need to be able to communicate with service platforms from different energy service providers. This requires open interfaces. Interoperability will therefore be a key factor in creating an ecosystem for the IoT, and the availability of standardised test suites will be an important enabler.

In line with our action plan for the creation of a new standard for smart appliances communications, we expect to produce the first ETSI Technical Specifications (TSs) in this area by mid-2015. One of these will define a framework for smart appliances communications based on ETSI M2M and oneM2M specifications. A second TS will review the European Commission (EC) study on smart appliances ontologies and adapt it to the structure of a standard, and then develop the ontology and map it onto ETSI M2M and possibly oneM2M standardised resources and services. In parallel, we are developing a four-part TS for the conformance testing of the ontology and the communications framework for smart appliances.



We will hold the sixth annual M2M Workshop in December 2015. It will focus on IoT Large Scale Pilot projects on smart living and eHealth, smart cities and the connected car, and will include a second oneM2M Showcase at which oneM2M's specifications will be demonstrated in real-life situations.



Other aspects

In co-operation with the EC, we have begun new work on IoT standardisation gaps identified in Large Scale Pilot projects.

In response to the EC Mandate on Smart Metering (M/441), we expect to publish an ETSI Technical Report (TR) on the security of smart energy infrastructures.

We are also working on the environmental aspects of smart cities, and new work on smart cities is being initiated related to the networks connecting digital multi-services and to the human factors aspects of the services in smart, accessible, sustainable cities and communities.

eHealth

eHealth could improve the quality and cost of healthcare and could help foster independent living. But the success of its implementation relies on the widespread digitalisation of all sectors of society and, although an increasing number of patients enjoy access services such as telecare and telemonitoring, the use of telemedicine is still very limited. One of the problems currently hindering the development of the 'virtual' clinic is a lack of interoperability. Standards therefore have a key role to play in assisting the development of new eHealth products and the growth of telemedicine.



Our eHealth project (EP eHEALTH) looks for practical solutions in a fragmented market and aims to facilitate and encourage new activities to promote inclusive development. For example, there is frequent confusion encountered in the vocabulary used to describe eHealth issues. In 2015, we will therefore develop a glossary of terms, drawing definitions from terminology in common use in the eHealth community of practitioners, developers, manufacturers and users.

We are also producing a TR describing a number of typical use cases in the eHealth domain and, from their analysis, will identify gaps in standardisation.

We plan to publish a new System Reference document on medical, wellness and assisted living applications.

Recognising the need to provide more robust mitigation techniques for critical use such as medical applications, we are producing a multipart TR on Ultra Wideband (UWB) mitigation techniques. Work continues on a new part which will describe the various UWB regulations in place in different parts of the world. When completed in mid-2015, this will provide a valuable reference tool for manufacturers seeking to enter cross-border markets.

Smart Body Area Networks

The potential of Body Area Network (BAN) technology, using small, low power devices, is expanding rapidly. Applications include health and wellness monitoring, sports training, personalised medicine (such as heart monitors) and personal safety, for example for fall detection.

However, there is need for a specific and dedicated technology, optimised for Smart BAN solutions. This would need to include features such as ultra-low power radio, with a lower complexity Medium Access Control (MAC) protocol for extended autonomy, enhanced robustness in the presence of interference, heterogeneity management and interoperability when communicating over heterogeneous networks in the future IoT. Other key issues to be addressed include Quality of Service and security.

Having completed specifications on low complexity MAC for Smart BAN and an ultra-low power physical layer for on-body communications between a hub and sensor nodes, in 2015 our Smart BAN committee (TC SmartBAN) plans to deliver its third TS. This will specify and formalise Smart BAN unified data representation formats, a semantic open data model and a corresponding ontology. This will provide a solution for heterogeneity management and facilitate interoperability.

We also expect to publish a TR providing a system description for Smart BANs, with an overview and use cases. In addition, we will publish a TR on measurement of the Smart BAN RF environment to characterise existing radio interference within a Smart BAN frequency band.

We are also developing a TR on service and application enablers for secure interaction and access to Smart BAN data and entities, as well as for Smart BAN automated monitoring and control operations. This will support the development of solutions for interoperability over heterogeneous networks.

Short Range Devices

We are updating our existing Harmonised Standard for Short Range Device (SRD) equipment in the 25 - 1 000 MHz frequency range, incorporating the necessary specifications and making provision to accommodate the anticipated further rapid expansion of SRDs. We continue to update our Harmonised Standard for 2,4 GHz wideband transmission systems, mainly in response to the use of SRDs in factories, for example in robotic arms, where high reliability and accurate response times are required.

Supporting these New Networked Services

Many of the connecting objects in M2M and IoT need only low throughput connectivity. We are addressing Low Throughput Networks (LTN), creating a TR on use cases and system requirements and two TSs on the LTN architecture and the protocols for LTN interfaces.



Towards a Fully Connected Wireless World

Radio technology is an integral part of our daily lives. We use it for mobile phones, for broadcast radio and television, in Wireless Local Area Network and cordless technology, Global Navigation Satellite Systems (GNSS), Radio Frequency Identification (RFID) and Short Range Devices. ETSI creates the standards which define many of these radio technologies and systems.

We also provide the standards which the regulatory authorities in Europe – and elsewhere – use to manage the radio spectrum environment and to ensure safe co-existence between all the systems which compete for use of limited spectrum resources.

Supporting the European Regulatory Environment

The new Radio Equipment Directive (RED) is already in force and will fully replace the Radio & Telecommunication Terminal Equipment (R&TTE) Directive from June 2016. We have embarked on a programme of work to ensure the effective implementation of the RED, co-operating closely with the European Commission (EC). In particular, we are reviewing and extending our suite of Harmonised Standards, which allow manufacturers to benefit from the presumption of conformity with the R&TTE Directive. Since the scope of the RED is broader than the R&TTE Directive, we are also creating System Reference documents and Harmonised Standards in new areas, to cover equipment such as sound and TV broadcast receivers, radio equipment operating below 9 kHz and radio-determination equipment (e.g. radar), which was not addressed by the R&TTE Directive. We are also revising the ETSI Guide to producing Harmonised Standards under the R&TTE Directive.

In the radio spectrum area, we will continue to contribute to the work of the Radio Spectrum Policy Group.

Spectrum Efficiency

Our Electromagnetic Compatibility and Radio Spectrum Matters committee (TC ERM) is responsible in ETSI for issues relating to spectrum usage. We will update the ETSI Technical Report (TR) which includes detailed information on spectrum use and an overview of our standards, reports and specifications, together with their applications and relevant frequency bands.

Reconfigurable Radio Systems (RRS)

Network resources are struggling to meet the growing demands of the Internet and mobile communications. Our RRS committee is supporting EC Mandate M/512 by developing new ways to increase the efficiency of spectrum usage, for example, through the exploitation of RRS, Licensed Shared Access (LSA) and TV White Spaces (TVWS, the areas of spectrum between allocated frequency bands that are unused by the spectrum owner over a given time in a given location).

In 2015 we plan to publish a European Standard (EN) on the radio reconfiguration related architecture for mobile devices. We are developing an EN on mobile device information models and protocols and expect to complete an ETSI Technical Specification (TS) on the reconfigurable radio frequency interface for mobile devices, which in due course will also be converted into an EN.

We will complete a TS on the system architecture for the operation of mobile broadband systems in the 2 300 - 2 400 MHz band under LSA.

We expect to publish two new ENs on TVWS: one to enable the operation of cognitive radio systems which are dependent for their use of radio spectrum on information obtained from Geo-location Databases and the other on the interface between cognitive radio systems and the spectrum co-ordinator.

Publication of a TS on the system requirements for RRS operating in IMT-2000 and GSM™ bands is scheduled for mid-2015.

Anticipating the requirements of the RED, we have begun a comprehensive programme of work related to device certification including a TS on the system requirements for dynamic recertification, and a revision of related use cases.

We will support software reconfiguration and reconfigurable radio activity with work on security solutions.

Developing the Potential of the 5 GHz band

We are channelling considerable effort into the development of the 5 GHz band, which is particularly attractive to device manufacturers because parts of it are allocated for European industrial, scientific and medical use. For example, TC ERM is enabling applications such as industrial automation, broadband links to ships, Intelligent Transport Systems (ITS), Radio Local Area Networks (RLANs) and direct-air-to-ground communications. We are developing a new Harmonised Standard for radio equipment to be used in the 5,8 GHz band (5 725 - 5 875 MHz) for wireless industrial automation and a new TR on its methods and concepts.

Our Broadband Radio Access Networks committee (TC BRAN) is developing a new Harmonised Standard for broadband direct air-to-ground communications using beamforming antennas and operating in the 2 GHz and 5,8 GHz range. We plan to complete three new TRs related to the possible extension of the current 5 GHz frequency allocation for RLANs. These reports will describe the mitigation techniques required to enable sharing between RLANs and different types of incumbent services: road tolling and ITS, radio location systems and Earth Exploration Satellite Services.

Mobile-Edge Computing

Mobile-Edge Computing (MEC) offers cloud-computing capabilities and an IT service environment at the edge of a mobile network. Our Industry Specification Group (ISG) on MEC expects to complete five specifications in 2015, addressing terminology, service scenarios, technical requirements, a framework and reference architecture and a Proof of Concept framework. We will then begin work on platform services and interfaces.



Advanced Mobile Communications Technologies

As one of the founding partners of the Third Generation Partnership Project (3GPP™) (www.3gpp.org), ETSI plays a prominent role in the development of mobile communications.



Release 12 was nominally completed in March 2015; most of the remaining features are due to be completed in 2015.

Several of these features relate to the use of LTE™ technology for emergency and security services, which are being developed in SA6, 3GPP's new working group on mission-critical applications. Work is well advanced with the most urgent of these, Mission-Critical Press-to-Talk.

Meanwhile, Release 13, comprising some 150 features and studies, is advancing well, including enhancements to the mission-critical elements. These include terminal-to-terminal (walkie-talkie) operation for use when no network coverage is available, enhanced by the use of terminals as repeaters to extend coverage.

3GPP expects to complete Release 13 in March 2016 (although again some features will probably be finished later). After a number of studies on the Internet of Things and Machine-to-Machine communications, 3GPP is considering six potential radio technologies which would meet the requirements of very low power consumption (battery life of the order of ten years) and, given that a very high density of terminals can be expected, very low burden on the network. These will be evaluated in Release 13, and one or more will be standardised.

Release 13 will also include work on additional bands for LTE, and yet more inter-band and intra-band combinations of channels for carrier aggregation. Advanced modulation, such as 64QAM, will be specified and characterised. Most other work in Release 13 will be refinement and enhancement of work started in earlier Releases, including power reduction in both terminals and base stations by the use of more efficient radio transmission.

Investigations will continue into LSA.

Preliminary work has already started for Release 14, with a dozen studies on topics such as driverless road vehicle operation, enhanced TV and video services, video-enhanced public warning broadcasts and mission-critical data communication. Other topics identified include password-based activation of IMS telephony, enhancements to the multimedia priority service and improved location capabilities for emergency communications.

There is much industry speculation on what form future 5G mobile networks will take. Research is already well advanced, and 3GPP will soon start its own studies, with a first workshop on 5G technology planned for the second half of 2015.

ETSI continues to support 3GPP through our Mobile Competence Centre, which also provides the secretariat for the European Friends of 3GPP.



Harmonised Standards for IMT

In 2015 our Mobile Standards Group (TC MSG) will continue to revise the Harmonised Standards for GSM base stations, repeaters and mobile stations, to align with 3GPP Releases. We will begin work on new Harmonised Standards based on 3GPP Release 13. We also plan to complete the transposition of the Harmonised Standards developed under the R&TTE Directive to take account of the RED. Our joint Task Force for Harmonised Standards for IMT (TFES) will begin work on new ENs based on 3GPP Release 12.

Satellite Communications

In 2015 our Satellite Earth Stations and Systems committee (TC SES) will extend its work on standards for high speed Internet access to fixed terminals or terminals on the move (in an aeroplane, on board a ship or in a vehicle) to smaller antennas and the use of non-geostationary satellite constellations. We will publish a new multipart TS on the SL satellite radio interface (Mobile Satellite Service terminals for geostationary systems operating in the L band). We are developing TSs on location systems based on GNSS and GNSS assistance via the broadcast channel.

Millimetre Wave Transmission (mWT)

Our new ISG on mWT is helping to prepare for the large scale use of millimetre wave spectrum in current and future networks. We plan to produce two white papers and four reports in 2015. One white paper will focus on regulation of the 60 - 95 GHz band, the other is aimed 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. The reports will define relevant use cases, identify the most suitable millimetre wave bands in relation to key transmission applications, provide an overview of semiconductor industry technology and analyse antenna use cases for point-to-point and point-to-multipoint millimetre wave links.

Other Wireless Work

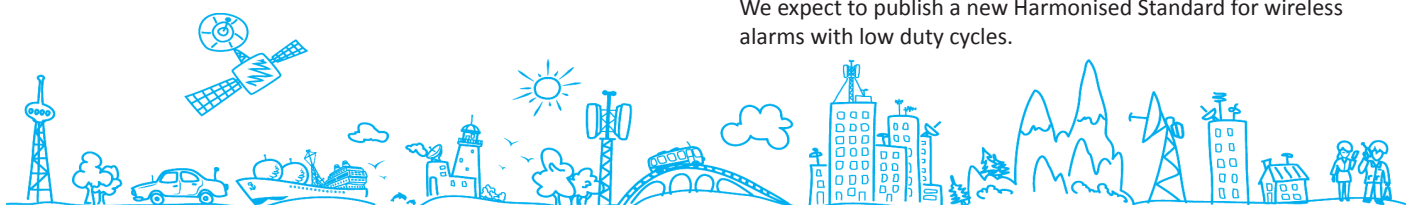
We expect to complete a new part for our EN on Short Range Devices using Ultra Wideband (UWB) technology for communications covering building material analysis and object discrimination and characterisation. We are preparing a System Reference document on amended mitigation techniques for UWB.

TC BRAN also plans to finalise a new TR on broadband wireless access and backhauling for remote rural communities.

Our Access, Terminals, Transmission and Multiplexing committee (TC ATTMM) expects to complete a new TR on small cells backhauling in LTE networks. We are revising our TR on Multiple Input Multiple Output techniques for point-to-point radio systems and plan to publish a TR on energy efficiency metrics for point-to-point radio systems by early 2016.

We are preparing a new TR on the use and effect of mathematical operations on relative measurement uncertainties.

We expect to publish a new Harmonised Standard for wireless alarms with low duty cycles.



Technologies for a Better Life

While technological progress has improved the way we communicate for both social and business purposes and opened up exciting new opportunities, we are careful to minimise any adverse social consequences. Part of our work therefore involves making products and services simpler to use, safer and more efficient. We are also committed to identifying energy efficiency solutions that mitigate the impact on climate change of the growing use of Information and Communications Technologies (ICT). The ultimate goal is to ensure that ICT improve the quality of life for all.

Energy Efficiency for ICT

In 2015 we will continue with the development of standards aimed at reducing the eco-environmental impact of ICT equipment in support of European Commission (EC) Mandate M/462. Before the end of July, in co-operation with the European Committee for Standardisation (CEN) and the European Committee for Electrotechnical Standardisation (CENELEC), we will present the EC with the results of the Phase 1 work programme for M/462 and details of the standards proposed to fill the gaps we have identified. The development of these new standards will form Phase 2 of our work.



Our Environmental Engineering committee (TC EE) is revising its ETSI Standard (ES) on measuring the energy efficiency of radio base stations. We are liaising with the Alliance for Telecommunications Industry Solutions (ATIS) to ensure our respective methodologies for the measurement of energy efficiency in ICT products and networks are aligned.

Other key work in 2015 includes the development, in co-operation with CENELEC, of a new standard to support the EU regulation on networked standby power consumption for household and office equipment (801/2013).

We are preparing a new ES on the 'green evolution of telecom goods' which will address requirements and methods for assessing the sustainability of ICT goods.

For the climatic requirements applicable to ICT, we expect to publish new versions of our European Standards (ENs) for classification and tests in different environmental situations, revised in line with North American specifications.

Work will continue on an EN on the alternating current power supply interface for ICT equipment connected to a 400V DC source.

To support this standard, we are also producing an ES on transient voltages at the 400V DC interface and we are developing an ES which will specify the architecture for connecting renewable energy sources to 400V power systems.

We are revising our EN for power supply requirements for equipment connected to a 48V DC voltage source and the associated ES on transient voltages on 48V DC power networks, and we are producing an ES on the colour and marking of DC cables and connecting devices.

Our Access, Terminals, Transmission and Multiplexing committee (TC ATTM) continues to focus on the 'green' needs of operational networks and sites and broadband transmission. We are developing a set of global Key Performance Indicators (KPIs) to describe the best practices, most efficient equipment and solutions to support the deployment of eco-efficient networks and sites, and to monitor the energy management of deployed broadband. These new KPIs will be outlined in a series of ESs and will provide ICT users with the tools to monitor their eco-efficiency and energy management in compliance with the Kyoto Protocol on climate change and the reduction of greenhouse gas emissions. We also plan to produce related ENs by 2016, in time to support potential new European legislation related to the development of efficient ICT products and components.

In 2015, we will embark on new work defining the networks connecting digital multi-services in cities. We plan to produce global KPIs for monitoring the sustainability of broadband solutions. The first standards and specifications on this subject are expected to be finalised by mid-2016.

We will also begin work on a number of ENs to support the Ecodesign of Energy Related Products Directive. This will be targeted at improving our standards for transmission equipment.

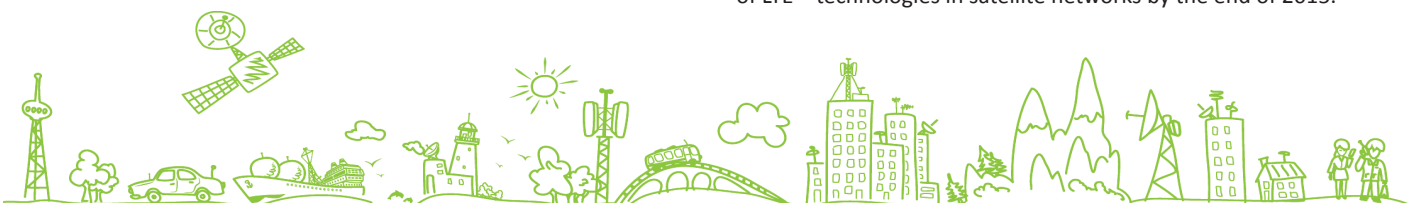
We continue to update our specifications on the sustainable engineering of networks, especially on ICT sites.

Our Industry Specification Group on Operational energy Efficiency for Users (ISG OEU) is developing specifications for operational eco-efficient ICT, addressing the power consumption and greenhouse gas emissions related to infrastructure, utilities, equipment and software within ICT sites and networks.

The group is currently working on specifications related to the operational measurement of energy consumption by information technology servers, storage units and broadband fixed access, and plans to extend this work to mobile access in 2015. When completed towards the end of the year, these four specifications will enable the development of global KPIs for broadband fixed access and mobile access.

We expect to complete new work related to the management of the end of life of ICT equipment before the end of 2015 and to finalise a definition of global KPI modelling for green smart cities.

We will produce new ETSI Technical Reports (TRs) on the environmental impact of satellite broadband networks and the use of LTE™ technologies in satellite networks by the end of 2015.





Access for All

Our Human Factors committee (TC HF) champions the importance of ensuring that developments in technology are usable and accessible to all people in society, including the elderly, the young and those with disabilities. Adopting a 'Design for All' approach in product and standards development helps ensure that everyone has effective access to devices, systems and services. By widening access, it also enables European companies to meet the needs of many more users, thus improving their competitive position in global markets. eInclusion is becoming increasingly important as the EC seeks to provide a regulatory framework for Design for All, which would make its consideration mandatory for manufacturers and service providers. This area of work is therefore expected to be one of our priorities in 2015 and beyond.

In response to EC Mandate M/473 on the inclusion of Design for All in relevant standardisation initiatives, we plan to publish an analysis of best practice in the creation and distribution of our electronic documents.

We will update our ES on the provision of relay services in Europe to take account of the growth of mobile and Internet Protocol (IP)-based communications. Relay services enable people with speech or hearing impairments to communicate with users of standard telephony using other means of communication (such as video or text), either directly or through an interpreter.

In 2015 we will focus on support for the use of services and devices by people with cognitive impairments. Cognitive impairments are often related to old age, so those who are currently active and taking full advantage of ICT may experience major usability problems and digital exclusion when they are older, unless action is taken now. We are therefore developing guidelines on user interfaces and functionality to enable the effective use of tablets, smartphones etc. by users with a range of cognitive impairments, either on their own or with remote assistance. In addition, we will look at the use of interfaces to help people who cannot read or write.

We expect to be involved in work in response to the forthcoming EC mandate on cyber security. Other possible topics for the future include a pre-study into the human factors aspects of the services in smart, accessible, sustainable cities and communities, and human factors guidelines for touchscreen keyboards.

Our User Group helps to ensure the needs of users are considered. In 2015 the group will focus particularly on the quality of telecommunication services and new mobile Internet services arising from the growth in the use of smartphones. Before the end of the year the group also expects to present the results of its study into the needs of visually impaired people in a new TR.

Early in 2016 we plan to publish guidelines on the best means of presenting alerting messages to users with special requirements such as the elderly, the very young or those with disabilities.

Media Quality and the User Experience

Our Speech and Multimedia Transmission Quality committee (TC STQ) is addressing the growing demand for wideband and 'super-wideband' (bandwidth up to 14 kHz) speech communication and multimedia in hands-free and video phone applications. In 2015 we will update our ETSI Technical Specifications (TSs) on the transmission requirements for super-wideband handheld (headset and hands-free) terminals, to optimise the end-to-end quality perceived by users.

We work closely with the Third Generation Partnership Project (3GPP™), regularly revising our multipart TS on the Quality of Service (QoS) aspects of popular mobile services to reflect the latest developments. In 2015 we will publish a new part on the definition of QoS parameters and their computation. We will also produce a new TS on test methods for background noise transmission for mobile terminals using super-wideband and fullband, and updated versions of our standards related to background noise.

We are developing a TR on the maximum levels of acoustic output from the headphones used by call centre agents. This will include an appropriate test methodology.

We expect to publish a TR on the handling of measurement uncertainties in the field of electro-acoustics.

We have begun work on a new multipart TS on benchmarking methods and background traffic load profiles, to ensure comparability of the test results for next generation services including Internet-based television services. We plan to publish a TR on bandwidth calculations and prioritisation in Voice over IP systems in the latter half of 2015.

We are producing a new TS on transmission quality and speech intelligibility for users with impaired hearing.

We plan to complete two new TSs on the basic requirements of emotion detectors to support subjective testing.

Safety

Our Safety committee (TC Safety) monitors developments in electromagnetic fields (EMF), electrical safety and safety in cable television systems, as these impact the interests of our members. In 2015 we will review current standards in the light of changes brought about by the revised EC Directive on the protection of workers from the risks related to EMF at work.



Standards for Secure, Reliable Communications

The rapid evolution and increasing complexity of new systems and networks, coupled with the sophistication of changing threats, present demanding challenges to the security of Information and Communications Technologies (ICT). To minimise exposure to risks, security must be built in from the beginning when designing new architectures, not added on later as an optional feature.

Security is therefore a key element in standardisation. Security standards provide the means for protecting the user and for creating a more secure and profitable environment for industry. In ETSI we focus on specific key aspects of security, but we also deal with security as an integral part of most areas of our work.

Smart Cards

Our Smart Card Platform committee (TC SCP) is responsible for the specification of the UICC, a smart card mainly (but not only) targeted at telecoms and used in various environments to secure service-related credentials. The UICC's most notable use is as a platform for the Third Generation Partnership Project (3GPP™) (U)SIM application, as well as for 3GPP2. It is also a secure element of choice for mobile contactless services such as ticketing or payment.

In 2015 we will further expand the requirements specification for the embedded UICC, which will include the development of a policy control function along with the related rules. We will also complete the first version of the technical realisation. We expect to define the architecture of the eUICC and its relation to the remote profile provisioning and management systems, as well as its physical, logical and electrical characteristics and the processes and security mechanisms required for the safe and effective management of subscription data.

We will continue to investigate test environment integrity and test case execution.

The requirements for UICC access optimisation were completed in 2014 and we are now working on their technical realisation. In particular, we will address file access and aspects related to processing and transferring files. These requirements will provide the basis for mechanisms to support a better user experience when the UICC is used as a platform for several applications, especially for Near Field Communication (NFC) applications which might be more processing-intensive. We expect to complete this work in 2015.

We plan to produce a new specification for testing the remote management of services based on a UICC using secured packet structures.

The UICC may not be the only secure element hosting NFC applications in a mobile device using the Host Controller Interface as an interface to the NFC controller. There is therefore a need to standardise interaction between the NFC controller, the UICC and these other secure elements, particularly the routing of data to a specific application (in any one of the secure elements) without user interaction. We are working with GlobalPlatform and the NFC Forum and expect this issue to be addressed in various specifications to be released in 2015.

We have begun work on mechanisms for monitoring the number of updates on UICC non-volatile memory, which is particularly relevant for the management of Machine-to-Machine (M2M) devices which can last much longer than other consumer devices.

Routine work includes the ongoing maintenance of our specifications and the updating of our test specifications to cover new features and functions.

Cyber Security

The Internet has become a critical infrastructure for both businesses and individual users and the number and variety of cyber-threats is rising. The different methods governing secure transactions in the various Member States of the EU, as well as beyond Europe, sometimes make it difficult to assess the respective risks and to ensure adequate security.



Our Cyber Security committee (TC CYBER) is looking at the security of infrastructures, devices, services and protocols, as well as tools and techniques to ensure security in the Internet, and we offer security advice and guidance to users, manufacturers and network and infrastructure operators.

By early 2016, we expect to have completed eight ETSI Technical Reports (TRs) and an ETSI Guide (EG). These include a TR on protection measures for ICT in critical infrastructures, specifically power and transport, which underpin all of the other critical infrastructures. In particular, we will address resilience, M2M communications and eHealth.

The other TRs concern security assurance through critical security controls, the protection and retention of personally identifiable information, security aspects of Lawful Interception (LI) and data retention interfaces, a security baseline for LI for Network Functions Virtualisation (NFV) and related platforms, a reference of organisations working within the global cyber security ecosystem, recommendations to business decision-makers to adopt security by default for technology platforms, and provision of means of describing and exchanging cyber-threat information in a standardised and structured manner. The EG will cover the post quantum computing impact on ICT security, as this will affect the choice and strength of algorithms in the future.



Electronic Signatures

In 2015, our Electronic Signatures and Infrastructures committee (TC ESI) will conclude its work on the second phase of the European Commission Mandate on Electronic Signature Standardisation (M/460). The goal is to achieve mutual recognition and the cross-border interoperability of electronic signatures and seals throughout Europe, by providing a rationalised framework for electronic signature standardisation.

We are tackling this in two ways, first by harmonising our European Standards (ENs) and specifications with the 'eIDAS Regulation' ('Regulation (EU) No 910/2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC'). Secondly we are increasing the potential global impact of our standards by streamlining the terminology used and emphasising the distinction in their content between industry best practices and the regulatory requirements of the eIDAS Regulation. This work will occupy us till the end of 2015 and will be undertaken in collaboration with the European Committee for Standardisation (CEN). Together we will update the TR which contains the rationalised standardisation framework.

In addition, we expect to complete new business guidance documents on the use of electronic signature standards and general requirements on policy and conformity assessment for signature creation and validation. We will also finalise a set of specifications and tools to test compliance and interoperability, particularly for signature creation and verification; publication of these ENs will follow in 2016.

We will address standardisation gaps to complement our ongoing work on signature formats, Trust Service Providers and Trust Lists, introducing new work on signatures in mobile environments. In the area of trust application service providers, we will launch work on electronic delivery using electronic signatures and we will study the standardisation requirements for the long term preservation of data including electronic signatures.

Lawful Interception and Data Retention

In 2015 our Lawful Interception committee (TC LI) will continue to update its LI and Retained Data standards and specifications by adding new services as necessary. We also plan to finalise a new TS on the Dynamic Triggering of Interception, which is required as a result of the diversification of service and network architectures, and to complete two TRs on LI and Retained Data in Cloud and virtual services.

We will publish a new specification to define a specific warrant electronic interface between two systems for the exchange of information relating to the establishment and management of LI.

We will continue to work on a new specification for an internal network interface for LI covering connections between LI systems and several network elements from different vendors.

We are developing a new specification on security for LI and Retained Data systems, a fundamental requirement which is becoming ever more challenging as networks become increasingly IP service-centric, globally distributed and, frequently, software-based. We will pay particular attention to NFV which is a key element in this area.

We are updating the specification for an LI interface for Terrestrial Trunked Radio (TETRA).

We are creating a dictionary of common parameters and we will develop two new ETSI Special Reports: a guide to LI and Retained Data standards and concepts and guidance on LI for LTE™.

We are addressing the LI requirements for NFV.

Security Algorithms

Our Security Algorithms Group of Experts (SAGE) will continue to develop cryptographic algorithms as needed to support our standardisation activities.



Security in New Technologies

Quantum Key Distribution (QKD) is a technique for sharing a digital key privately by the exchange of single photons or weak pulses of light over optical fibre or free space links. This offers a higher level of security than that provided by techniques based on computational complexity. Substantial government investments were announced in QKD networks around the world in 2014 and standards are required urgently to ensure interoperability between different suppliers.

In 2015, our Industry Specification Group (ISG) on QKD expects to complete three specifications, addressing the characterisation of optical components for QKD systems, protection against Trojan horse attacks and deployment parameters. We also plan to introduce new work on the characterisation of assembled QKD modules to help users know whether products have been appropriately designed and constructed.

Our new ISG on Quantum-Safe Cryptography (QSC) will assess the various proposals from industry and academia for QSC for deployment and develop specifications for quantum-safe ICT applications. We have begun work on five new specifications and will also offer practical advice and guidance to industry on deployment issues. In October 2015, in co-operation with the Institute for Quantum Computing at the University of Waterloo, Canada, we will be organising our third QSC Workshop in Korea.

In 2015, our ISG on Information Security Indicators expects to publish new guidelines for testing the effectiveness of security risk detection capabilities. These guidelines will complete a set of five specifications which together will provide a reference model for the measurement of information security risks. This model will enable organisations to assess themselves and benchmark their level of assurance and the effectiveness of their security measures. We also plan to revise our existing specifications to take into account users' feedback.



Facilitating Content Consumption Whatever the Platform

The Internet, mobile communications and broadcasting are converging. But the standardisation of these different areas has traditionally followed different paths, so they do not interoperate across the same platforms. We are addressing the urgent need to align the diverse specifications for content delivery in a converged environment supporting Internet Protocol Television (IPTV), mobile TV and broadcast TV – for the benefit of both the industry and the consumer.

Broadcasting

We deal with the standardisation of broadcast systems, programme transmission and receiving equipment in a Joint Technical Committee (JTC) which brings us together with the European Broadcasting Union (EBU) and the European Committee for Electrotechnical Standardisation (CENELEC) – JTC Broadcast.

In 2015, JTC Broadcast will concentrate on digital broadcasting. The JTC is updating the ETSI Technical Specification (TS) on Digital Video Broadcasting (DVB) Audio Video Coding to address AC-4 audio aspects and DVB 3DTV Phase 3. AC-4, the innovative codec for next generation digital audio compression for audio-only and audio for video delivery, offers an advanced sound experience to meet modern entertainment requirements including home theatres, online streaming and video games. The JTC is now extending the specification to enable new, more immersive and personalised consumer audio experiences in the future.



The committee plans to update the TS on the receiver status and control interface for Digital Radio Mondiale to accommodate the xHE-AAC codec.

The JTC also expects to revise its popular DVB service specifications, describing the necessary metadata for TV broadcast. The 'DVB-SI (Service Information) specification' enables all the various components of a video service to work together. Current work includes companion screens and streams and Ultra High-Definition TV.

The existing DVB IPTV standards are being updated to take account of IPv6.

We expect to publish guidelines for both DVB-S2 and DVB-S2X for broadcasting, interactive services, news gathering and other broadband satellite applications.

The JTC will also address 3DTV, adding High Efficiency Video Coding (HEVC) coded services to its existing specification. The Hybrid Broadcast Broadband TV specification will be revised to take account of recent developments and to add support for companion screen, advert insertion, Timed Text Markup Language subtitles, Push Video on Demand etc.

Programme Making and Special Events

The Programme Making and Special Events (PMSE) market urgently needs access to new spectrum resources to satisfy demand both now and in the future. As an alternative to the allocation of new spectrum, we are investigating the possibility of using cognitive spectrum access methods to allow the use of hitherto unavailable spectrum and to facilitate spectrum sharing.

In 2015 we expect to publish a revised Harmonised Standard on wireless microphones in the 25 MHz - 3 GHz band, which takes account of the latest developments. We plan to finalise four System Reference documents by the middle of the year, addressing intercom systems, conferencing systems, wireless microphones and PMSE.

We will revise our Harmonised Standard and the ETSI Standard (ES) on wireless video links in the 1,3 - 50 GHz band in line with recent developments.

Content Delivery and Protection

Our Industry Specification Group (ISG) on the Embedded Common Interface (ECI) for exchangeable Conditional Access (CA)/Digital Rights Management (DRM) solutions is developing a standardised system architecture for general purpose, software-based, embedded and exchangeable CA/DRM systems. This will counter market fragmentation and allow consumers to continue using equipment and content they have previously paid for, after a move or a change of network provider, or to access content from multiple service providers from the same device. We are creating a seven-part specification; in 2015 we expect to complete the remaining five parts, covering the ECI framework, requirements, ECI interfaces, virtual machine and advanced security.

Localisation

The localisation industry is engaged in making computer software and other materials linguistically and culturally appropriate to users in different locations. Our ISG on Localisation Industry Standards is producing specifications to ensure quality and efficiency, as well as interoperability in data exchange between the various products used in the industry.



Fulfilling the Promise of Unlimited Bandwidth

Today's consumers expect communications services to be easily accessible and available everywhere, on whatever devices they are using. Technically, this means networks must converge. We provide a comprehensive set of standards for access network technologies.

Network Technologies

Our Network Technologies committee (TC NTECH) is standardising current network technologies, focusing on the specification of the protocols required on the interfaces of the functional architecture supporting European requirements for emergency caller location determination and transport.

We also continue to maintain Next Generation Network specifications, in particular for business communications, and to provide guidelines on naming, numbering and addressing in managed networks.

In the area of future network technologies, we are addressing autonomic management. In 2015 we will publish an ETSI Technical Specification (TS) outlining the Generic Autonomic Network Architecture (GANA) reference model. We will continue to work on the application of the GANA reference model onto concrete use cases, such as the Third Generation Partnership Project IP Multimedia Subsystem, fixed broadband access networks and ad hoc/mesh networks, and on the evolution of the reference model to take into account emerging technologies such as Software-Defined Networking (SDN) and Network Functions Virtualisation (NFV).

Other work will include the production of an ETSI Technical Report (TR) on the testability and certification of autonomic functions, with the aim of building confidence in autonomic systems, and the establishment of a framework to co-ordinate and promote public demonstrations of Proof of Concept (PoC) platforms illustrating key aspects of autonomic network engineering.

Cloud

Work has begun on Phase 2 of the Cloud Standards Co-ordination in collaboration with the European Commission. A survey into customers' Cloud-related requirements is being conducted and we will assess the part standards can play in supporting users' needs.

Cable Networks

In 2015 our Integrated Broadband Cable Telecommunication Networks committee (TC CABLE) expects to complete a new ETSI Standard (ES) for home routers which will define a core set of features to enable multiple subscriber devices to gain access to high-speed data services using the Data Over Cable Service Interface Specification (DOCSIS™). This standard allows for both IPv4- and IPv6-enabled devices to gain connectivity to the Internet. In addition, we expect to complete the standardisation of the evolution of DOCSIS 3.0 to 3.1.

Following the introduction of new mobile radio communication services in the UHF 790 - 862 MHz band, we plan to publish a TR describing the evolving electromagnetic environment. This will help cable network operators and operators of mobile communication networks to assess the impact of co-existing services and establish appropriate mitigation measures.



We will publish a TS on measurement methods for the network performance of broadband data services, taking into account recent developments in IP technology. This will enable consumers to compare the performance of different service providers.

Network Functions Virtualisation

Our Industry Specification Group (ISG) on Network Functions Virtualisation is facilitating the development of an open, interoperable NFV ecosystem which will enable rapid service innovation for network operators and service providers. We have embarked initially on 28 new documents (including normative specifications) in our second phase of specification development. Building on experience gained through various PoC and Open Source communities, in 2015 we expect to produce additional specifications to help product developers and other industry bodies develop reliable, secure, and interoperable multi-vendor virtualised solutions across different fields of applications, including those which are highly distributed (such as virtual customer premises equipment).

Transition to IPv6

The public IPv4 address space managed by the Internet Assigned Numbers Authority (IANA) was completely depleted by February 2011 and subsequently at the main regional registries. As a result, new entrants are unable to join the Internet. Our new ISG on IPv6 Integration is addressing the transition from IPv4 to IPv6, which will support the sustainability and growth of the Internet and enable it to cater for the new technologies that will adopt it.

We will outline best practices, gather support and create awareness of the impact of IPv6 for critical stakeholders. We have also begun work on the impact of IPv6 on emerging technologies such as the Internet of Things, smart grids, OpenStack-based Cloud computing, SDN-NFV and the 5G mobile wireless Internet.

In addition, TC CABLE plans to finalise tests for each of the five transition technologies (NAT64, MAP-E, DS-Lite, 464XLAT and 6RD), producing industry test descriptions which will provide interoperability and test cases to enable the deployment of IPv6 transition technology. We are also preparing a TS outlining a strategy to help network operators deploy these transition technologies in operational networks. We plan to develop a series of specifications for each of the transition technologies to address the engineering and end-to-end operational aspects across the whole cable network domain, and we will develop requirements for the network test platforms.



Connecting Devices in the Home and Office

The variety of devices that need to be interconnected is growing rapidly and most require broadband. The new services being developed are creating a 'Connected Home' and a 'Connected Office'. Our standardisation for home and office focuses on three aspects: home and office wireless, home and office interconnection, and home and office requirements, including Quality of Service (QoS) and security.

Cordless Voice and Broadband Communication

Our Digital Enhanced Cordless Telecommunications (DECT™) specification is a global success. Over 800 million DECT devices have been installed worldwide, the system has been adopted in over 110 countries and DECT products now account for more than 80% of the world digital cordless telecommunications market.

In 2015, our DECT committee will continue its work on Ultra Low Energy (ULE) DECT, a new application of the technology developed with Machine-to-Machine applications in mind. DECT ULE offers low power consumption, good QoS (a unique feature compared with other low power wireless standards) and wider coverage than competing technologies. Initially DECT ULE is being targeted at home automation networks; possible applications include lighting controls, residential hubs and gateways and intercoms and entry-phones, as well as simple medical pendant alarms (for instance to monitor heart rate or movement and including an alarm button and additional voice capability).

In 2015 we will further enhance the ULE specifications adding more functionality for operation with repeaters and investigating the possibility of combining the ULE function more effectively with No-Emissions Mode (NEMo). The revision of the repeater specification will also include the new improved security algorithms and software update over-the-air. Other work will include updates of the radio test specification and the base standard to include new protocol elements for ULE.

We will also begin work on two new Harmonised Standards for DECT, which will take account of the introduction of the new Radio Equipment Directive. These will then also cover DECT ULE.

We will continue to maintain Next Generation DECT specifications.

We will also provide input to the Radio Standardisation sector of the ITU (ITU-R) for an update of the International Mobile Telecommunications 2000 (IMT-2000) Recommendation M.1457.

Home and Office Interconnection

In the area of infrastructure, physical networks and communication systems, our Access, Terminals, Transmission and Multiplexing committee (TC ATTM) is developing a new ETSI Technical Specification (TS) on the use of single mode optical fibre systems for home cabling to enable interoperability among different suppliers. Work is also ongoing on a two-part TS on the use of plastic optical fibre systems for home cabling. Publication of these specifications is expected early in 2016.

ETSI is leading work at the global level on the standardisation of reverse power feeding. To date, we have addressed the architecture

and high level design. In 2015 this work will be taken to the next phase, specifying detailed requirements for reverse power feeding for Fibre to the Distribution Point, whereby the node at the distribution point can be powered from the customer premises equipment.

Powerline Communications

Our Powerline Telecommunications committee (TC PLT) is addressing the transmission of Ultra High-Definition (UHD) video streams based on High Efficiency Video Coding (HEVC) video compression over Multiple Input Multiple Output (MIMO)-PLT networks. MIMO-PLT combined with HEVC encoded video will facilitate the distribution of UHD video-on-demand and 4K video streaming, linking home network gateways (Digital Subscriber Line (DSL), cable, satellite and fibre to the home) to 4K UHD receiving devices (smart TV sets, set-top boxes etc.). It will enable whole home coverage of current and future video services.



In particular, we are investigating new transmission technologies for uncompressed video over powerlines. By mid-2015 we expect to complete an ETSI Technical Report (TR) containing recommendations for the specification of powerline telecommunications for very high bit rate short range links using a Powerline High-Definition Multimedia Interface, which will fill the standardisation gap between existing PLT modem specifications and video compression standards. One use of this technology would be to simplify the installation of home cinema.

In 2015 we will extend this work, examining the impact of new video compression and transportation standards on powerline networks coverage and producing guidance for PLT vendors. We are preparing a TR which will provide the necessary information for the development of standards to improve video services in the connected home.

To preserve the high throughput of DSL technologies, we are also working on the co-existence of DSL modems and PLT on customers' premises. We plan to complete a test specification for the measurement of PLT interference with Very-high-bit-rate DSL 2 (VDSL2) and the G.fast Recommendation (G.9701, developed by the Telecommunications Standardisation sector of the International Telecommunication Union). We will hold a Plugtests™ event to assess proposed solutions.

By mid-2015 we expect to have completed a new TS on spectral management for PLT to minimise interference between neighbouring networks, enabling the efficient sharing of the power allocation for broadband PLT modems operating in a network.



Interconnecting in a Multi-polar World

Interoperability is driven by market demand and is crucial in a multi-vendor, multi-network and multi-service environment. It gives users greater choice of products and allows manufacturers to benefit from the economies of scale of a wider market.

Our Centre for Testing and Interoperability (CTI) is a centre for excellence, providing hands-on expertise in standards validation through the organisation of our world-renowned Plugtests™ events, the development of test specifications and the application of best practice specification methodologies. These techniques combine to ensure that our standards provide a solid basis for the implementation of robust and interoperable products.

Test Specifications

In 2015 we plan to develop test specifications for smart appliances, various Machine-to-Machine protocols, Network Functions Virtualisation (NFV) and Small Cells. We will also continue with the conformance tests for Intelligent Transport Systems, electronic signatures and security protocols such as Diameter.



We will provide the Third Generation Partnership Project (3GPP™) with LTE™ test specifications for terminal certification. Our test suites are used by external organisations such as the Global Certification Forum to provide certification schemes for mobile devices, thus ensuring worldwide interoperability. In 2015, we will work on the specification and implementation of protocol conformance tests for the new features introduced in 3GPP Release 12. This includes two key features of particular interest to the industry: Wireless Local Area Network (WLAN)/3GPP radio interworking (to improve offload to/from WLAN decisions by the network, thus enhancing the user experience) and device-to-device proximity services (the first set of LTE enhancements to support the requirements of public safety and critical communications).

Our Core Network and Interoperability Testing committee (TC INT) helps network operators to implement IP-based networks that can carry both fixed and mobile services simultaneously. In 2015 we will develop new approaches for testing dynamic and adaptive network infrastructures such as Self Organising Networks. We will produce conformance test specifications for the Diameter Protocol over the Cx and Dx reference points and the GTPv2-C Protocol over the S11 reference point. We also plan to address benchmarking and quality assessment of the core network in the end-to-end environment.

Working with Partners in Industry

Interoperability events require close co-operation with industry, fora and other organisations. In 2015 we expect to organise around 15 Plugtests events, with varying formats and in different locations, to meet the specific needs of our members and the industries we serve. To minimise the costs involved for participants, an increasing number of these events are being organised remotely.

Among the highlights of 2015 we are planning interoperability events for smart cities (for example, Traffic Shaper for maximising traffic flow during rush hour), Internet of Things protocols such as Deterministic IPv6 over the TSCH mode (6TiSCH), eInvoicing and the first full interoperability event for oneM2M implementations. We will continue the series of eCall Plugtests in anticipation of European deployment in 2018.

New Approaches

We are opening new avenues in testing and interoperability. For example, in 2015 we plan to build on innovative approaches such as technology evaluations, hackathons and Proofs of Concept (PoC), with the 'NFV PoC Zone' and the PoC Framework for Mobile-Edge Computing. We will look at how agile development approaches may be applied to test specification development. We are also investigating the impact – and the potential – of Open Source development on standardisation, testing and interoperability.

Methods for Testing and Specification

Our Methods for Testing and Specification committee (TC MTS) creates standards for testing and specification languages and provides frameworks and methodologies to enable the production of documents that are easy to understand and easy to use. Its work is therefore critical to the market success of numerous technologies.

The main focus of 2015 will be our new Test Description Language (TDL), which we plan to launch in October. TDL has been three years in development, driven by industry. It fills the methodology gap in existing test specification languages between the simple expression of what needs to be tested and the complex coding of the executable tests in Testing and Test Control Notation version 3 (TTCN-3). The development of TDL is part of our work on model-based software engineering and will improve and accelerate test development without sacrificing quality.

In 2015 we will also continue to maintain TTCN-3 and we plan to produce new conformance test suites for TTCN-3 tools. One of our biggest success stories, TTCN-3 has been in widespread use around the world for nearly 15 years.

In the area of security testing, we are complementing our existing standards with two new ETSI Guides, one on the security assurance lifecycle and the other on risk-based security testing methodologies.

For the first time, the annual ETSI International User Conference on Advanced Automated Testing (UCAAT), organised by TC MTS and the CTI, will be held in ETSI in October 2015. Over the years, our user conferences have continued to attract hundreds of delegates from all over the world. A highlight of this year's conference will be the launch of TDL.



Mission-critical Communications to Rely on

Communication is a key factor in an emergency situation, both small incidents such as a man overboard as well as major natural disasters.

Terrestrial Trunked Radio

With standards successfully established now for narrowband and wideband Terrestrial Trunked Radio (TETRA), our TETRA and Critical Communications Evolution committee (TC TCCE) is focussing on a broadband extension to the TETRA standard. This will require additional spectrum and we continue to work closely with European regulators in attempts to gain spectrum allocations for broadband services for Public Protection and Disaster Relief (PPDR) users.

Broadband could provide many high bandwidth services such as streaming video, automatic number plate recognition, location services and database access, which would make it ideal for PPDR and other mission-critical services. The plan is to enhance existing standards for technologies by the development of interfaces and applications, to make them suitable for mission-critical applications.

In particular, we are pursuing the possible development of LTE™ to accommodate critical communications users. We are working closely with the Third Generation Partnership Project (3GPP™), specifically its new working group on critical communications (SA6), on the standardisation of essential features such as group call system enablers, and off-network proximity services (ProSe, the equivalent of Direct Mode in TETRA, by which terminals can operate outside main network coverage). We expect to publish the results of a study into the related security mechanisms by mid-2016. Within ETSI, we are focussing on the standardisation of the interfaces to broadband systems.



In addition we continue to update the TETRA standards to meet the developing needs of users. We are making improvements to the TETRA Enhanced Data Service (TEDS), including the addition of voice services. We plan to publish a User Requirement Specification for TETRA Direct Mode Operation, adding a new part to the existing ETSI Technical Report (TR).

Emergency Calling and Alerting

By the end of 2015 our Emergency Telecommunications committee (SC EMTEL) expects to have published a study into methods of delivering positional information from smartphones to the Public Safety Answering Point (PSAP) during emergency calls.

We also plan to complete a TR defining dictionaries which will enable alerting messages to be encoded from keywords, or even generated automatically, and then decoded in the receiver into the user's preferred language.

We are developing guidelines on the best means of presenting alerting messages to users with special needs such as the elderly, the very young or those with disabilities. Publication of a TR is scheduled for early in 2016.

In 2015, we plan to begin new work on alerting for television, exploiting the potential of new Hybrid Broadcast Broadband Television to extend public warnings to television as well as phones.

We are updating our good practice guidelines for emergency calls made from private networks operated by large companies, hotels etc. The aim is to ensure reliability in emergency calls from packet-switched mini-exchanges by specifying, for example, what information should be sent to the PSAP.

We are continuing to enhance our ETSI Technical Specification (TS) for EU-Alert, the European Public Warning System which uses the Cell Broadcast Service, adding rich media alerts in addition to text messages. This could enable pictures of missing children, for example, to be broadcast to smartphones.

Other possible new work for 2015 includes next generation emergency calling, exploring new ways to contact the emergency services via, for example, social media, texting or sending video clips.

We continue to support the European Commission's in-vehicle emergency call service, eCall, with conformance and interoperability tests.

Other Aspects of Public Safety Standardisation

We expect to complete a new two-part TS which will provide a framework for the deployment of a satellite-based emergency telecommunication network for use, for example, by first responders in mass casualty incidents. This specification addresses the different requirements for incidents respectively on the road or rail in the countryside and those caused by a major earthquake in an urban environment.

Following discussions at the World Radiocommunication Conference 2015 (WRC-15) in November, we expect to introduce new work on the potential benefits of synergies between PPDR/civil Private Mobile Radio, military and commercial domains.

Other work includes acoustic safety limits, standards for maritime safety equipment and various mechanisms for road safety through the use of Intelligent Transport Systems.

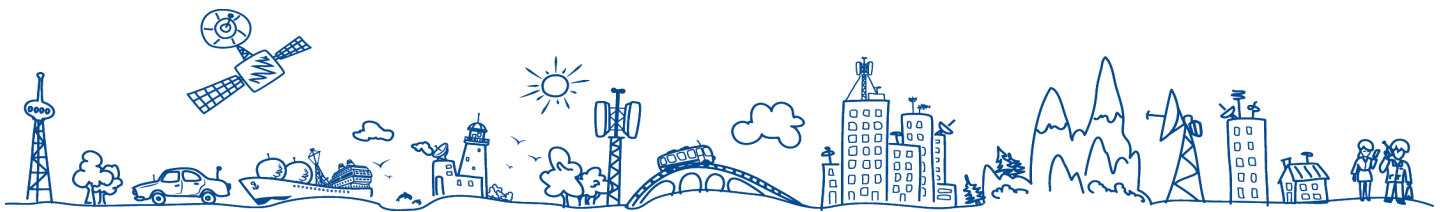


- 2G, 3G, 4G Mobile Communications
- Air Traffic Management
- Automotive Radar
- Autonomic Systems
- Body Area Networks
- Broadband Wireless Access
- Broadcasting
- Cable Networks
- Cloud Technology
- Cognitive Radio
- Cyber Security
- DECT™
- Digital Mobile Radio
- Digital Rights Management
- eHealth
- Electromagnetic Compatibility
- Electronic Signatures
- Emergency Communications
- Energy Saving
- Environmental Aspects
- Fixed-line Access
- Fixed Radio Links
- Human Factors
- Identity Management
- IMS Network Testing
- Intelligent Transport
- Internet of Things
- Interoperability
- Lawful Interception
- Machine-to-Machine Communications
- Maritime Communications
- Media Content Distribution
- Millimetre Wave Transmission
- Mobile Communications
- Mobile-Edge Computing
- Network Functions Virtualisation
- Next Generation Networks
- Powerline Communications
- Protocols
- Public Safety Systems
- Quality of Service
- Quantum Key Distribution
- Radio Regulations
- Radio Systems
- Railway Communications
- Safety
- Satellite Communications
- Security
- Security Algorithms
- Short-range Radio
- Smart Appliances
- Smart Cards
- Smart Metering
- Software-Defined Radio
- Telemedicine
- Testing
- Terrestrial Trunked Radio (TETRA)
- Wireless Medical Devices

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