Interoperability

ETSI

World Class Standards

A Connected World

Security

Home & Office

Public Safety

Better Living
with ICT

Interoperability

Content
Delivery

Connecting
Things

Networks

Transportation

Wireless
Systems

ETSI

Interconnection in a multi-vendor, multi-network, multi-service environment

The Centre of Excellence for interoperability in a multi-polar interconnected world

Interoperability

Standardization and Interoperability

Interoperability is driven by market demand. It gives users much greater choice of products, and allows manufacturers to benefit from the economies of scale of a wider market. In order to achieve interoperable products and services, clean unambiguous standards need to be developed and followed.

ETSI's unique approach

ETSI has two important horizontal activities that support the production of interoperable standards, namely TC MTS (Methods for Testing and Specification) and the ETSI CTI (Centre for Testing and Interoperability).

TC MTS creates standards related to testing and specification languages and provides frameworks, guidelines and methodologies for other ETSI committees.

TC MTS works very closely with the ETSI CTI to develop the background material which is then used in support of other ETSI committees as well as other relevant standardization bodies. Much of the work done by TC MTS has also been adapted and used globally by other organizations, fora, and industry bodies.

- ETSI's Centre for Testing and Interoperability (CTI) provides hands-on expertise and support to the ETSI Technical Organization and 3GPP for:
- Standards validation (focusing on Plugtests™ interoperability events)
- Development of test specifications (conformance and interoperability)
- Application of protocol specification techniques
- Advancement of methodologies and best practices, including TTCN-3.

ETSI is unique among Standards Development Organizations in having pioneered the combined use of these practices. As a result we deliver interoperable standards of consistently high quality.

ETSI Test Specifications

For over 20 years ETSI has been a pioneer among standardization bodies in recognizing the importance of achieving interoperability through testing. Many key ETSI technologies have an accompanying set of standardized test specifications that may be used by ETSI Members and others for in-house product development or industrial certification schemes.

ETSI test specifications are written using Testing and Test Control Notation Version 3 (TTCN-3).

TTCN-3 is a standardized test specification language developed and maintained by ETSI's TC MTS and specifically designed for testing and certification. TTCN-3 is used in a variety of application domains and types of testing in industry, research, international projects and academia. The ETSI TTCN-3 standards have also been adopted by the ITU-T in the Z.160 series.
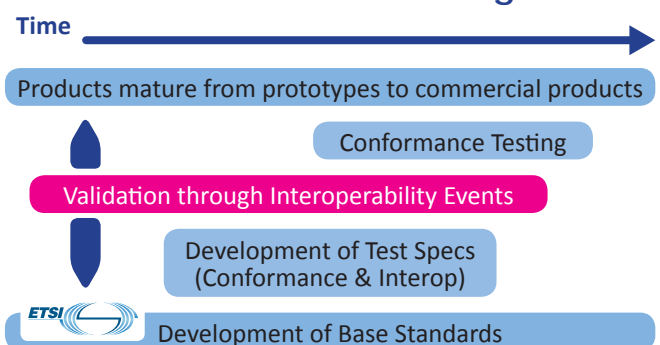
Validation through ETSI interoperability events

ETSI organizes interoperability events, or Plugtests™. These are a well-proven and cost-effective approach to validate standards for interoperability, through validating the interoperability of equipment based on the standards.

These events bring together engineers and equipment in a neutral environment where they can execute a large variety of real-life scenarios in various combinations.

Interoperability events provide an open forum for resolving issues of non-interoperability and other technical aspects related to standards development and validation. It is a place for engineers to meet in a very practical environment and to provide feedback to the standardization groups.

Relationship Between Standards, Validation and Testing

Time →

Products mature from prototypes to commercial products

Conformance Testing

Validation through Interoperability Events

Development of Test Specs (Conformance & Interop)

ETSI — Development of Base Standards

ETSI Groups in the Interoperability Cluster

Interoperability activities are a feature of most ETSI committees:

- **3GPP** - Continued development of user equipment test specifications for use by GCF (Global Certification Forum), PTCRB (North America) and TDIA (China), and organization of a series of femtocell interoperability events with the Femto Forum

- **AERO** - A series of Plugtests with EUROCAE on VoIP for ATM (Air Traffic Managment) to improve the robustness between Voice Communication Systems (VCS) as well as the interworking between VCS and Ground Radio Stations (GRS)

- **ATTM** - A series of Plugtests with the Fixed Services and Networks Alliance on Gigabit Passive Optical Networks (GPON)

- **BRAN** - Development of conformance test specifications, interoperability test specifications and the organization of interoperability events with the WiMAX Forum

- **CLOUD** - Organization of GRID interoperability events and demonstrations with the Open Grid Forum

- **DECT** - Development of conformance test specifications for the DECT standards and more recently working with the DECT Forum on the organization of interoperability events for Cordless Advanced Technology- Internet and Quality interoperability events (CAT-iq)

- **eHealth** - Participation in IHE (Integrating the Healthcare Enterprise) CONNECTATHON events with the provision of state-of-the-art TTCN-3 test tools for HN7 profiles

- **ERM** - Development of test specifications for PMR (Public Mobile Radio), DMR (Digital Mobile Radio) and the organization of several RFID Plugtests.

- **ESI** - Development of an interoperability portal to facilitate remote interoperability events for standards XAdES, CAdES, PAdES (Advanced Electronic Signature)

- **HF** - Plugtests events for handsets from a user perspective

- **INT** - Development of test specifications and organization of Plugtests for IMS (Internet Multi-media Subsystem) and RCS (Rich Communication Suite)

- **ITS** - Development of test specifications and test frameworks, as well as interoperability events on Cooperative Mobile Systems and Road Toll Systems/DSRC co-existence.

- **LI** - Organization of interoperability events for Lawful Interception

- **MTS** - Development of specification techniques including TTCN-3 and testing methodologies such as Automated Interoperability Testing

- **NTECH** - Development of test specifications for NGN

- **oneM2M** – Interoperability demonstrations

- **PLT** - Organization of co-existence testing events, for example between PLT and ADSL

- **SCP** - Development of prototype testing tools and methodology for ePassport readers (jointly with MTS)

- **SmartM2M** – Interoperability demonstrations

- **STQ** - Organization of speech quality test events

- **TETRA** - Development of test specifications

ETSI Plugtests™ Events

Since the year 2000, ETSI has organized around 180 Plugtests™ events worldwide covering well over 50 different technologies.

For more information visit: http://www.etsi.org/index.php/services/plugtests.

Many interoperability events are supported by the European Commission.

Standardization Activities

Test Specifications

Our Core Network and Interoperability Testing committee (TC INT) assists the industry with the deployment of the Internet Protocol (IP) Multimedia Subsystem (IMS) by producing high quality test specifications.

We are developing conformance test specifications for the Diameter protocol, for use in roaming. We will continue to develop LTE test specifications for terminal certification and conformance test specifications for LTE.

Conformance testing during the development phase of Evolved Packet Core (EPC) and IMS products will significantly reduce the time-to-market of the LTE architecture, as protocol conformant products will be less likely to cause interoperability problems with the products of other vendors.

We are also consolidating the Intelligent Transport Systems (ITS) conformance and interoperability validation platform and developing conformance test specifications for Digital Enhanced Cordless Telecommunications (DECT™).

Methods for Testing and Specification

Our Methods for Testing and Specification committee (TC MTS) plays a significant role in the market success of numerous technologies. The main focus is the Test Description Language (TDL), a new language for the specification of test descriptions and the presentation of test execution results, primarily for functional testing, but also potentially for other types of testing.

TDL will fill the gap between the simple expression of what needs to be tested (the test purposes described in prose or Test Purpose Language) and the complex coding of the executable tests in Testing and Test Control Notation version 3 (TTCN-3). TDL exploits the benefits of model-based software engineering, accelerating test development without sacrificing quality. In effect, TDL represents the next generation of testing languages.

We also plan to produce a standardized concrete graphical syntax for end-users and a TDL exchange format to foster tool interoperability.

At the same time, we will continue to maintain TTCN-3, and to upgrade the conformance test suite for the TTCN-3 core language, to take account of the latest evolution of the language and to extend the coverage of the suite.

In the security area, we are drafting a Technical Specification (TS) on security testing terminology and an ETSI Guide (EG) on the security assurance lifecycle.

Plugtests Events

Plugtests are organized on a variety of subjects, depending on demand. Current activities are dominated by technologies related to Machine-to-Machine (M2M) communications and the Internet of Things (IoT), including Constrained Application Protocol and IPv6 over low power Wireless Personal Area Networks, Small Cell technologies, the ETSI M2M architecture, semantic interoperability, home appliances and Vehicle2Grid.

Other subjects of importance are Network Functions Virtualization and eCall, the European in-vehicle emergency call service.

Following the success of our testing of Electronic Signatures in support of European Commission (EC) Mandate 460, we have been awarded an EC grant to carry out eight more remote Electronic Signatures and Infrastructures events over the next two years.

To find out more about ETSI's Interoperability activities or to get involved, please contact **ANTHONY WILES,** Interoperability cluster coordinator:
interoperability@etsi.org