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Achieving Technical Interoperability - the ETSI Approach

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Different ‘levels’ of Interoperability

- Technical
- Syntactic
- Semantic
- Organisational

"Interoperability is the ability of two systems to interoperate using the same communication protocol" from ETSI Project TIPHON (now closed).

Or in the context of 3GPP

- "the ability of two or more systems or components to exchange data and use information"
Typical symptoms of non-interoperability

- Where are you?
- What did you say?
- Why did you do that?
Interoperability and complex systems

- ICT standards increasingly specified by islands of standards
- Multiple sources of standards for 1 system
  - e.g. NGN, IMS
- Multiple specifications for 1 protocol
  - e.g. SIP
Root causes of standards failing to provide interoperability

- Incompleteness
- Inadequately defined interfaces (reference points)
- Poor handling of options – too many, poorly specified
- Lack of clarity
- Poor maintenance
- Lack of system overview
- Using standards beyond their original purpose
- Varying quality of standards in 1 system
Building interoperability into ETSI standards

- Manage for interoperability!
- Specify for interoperability!
- Validate for interoperability!
- Test for interoperability!
- Maintain for interoperability!
Manage for interoperability!

- Good project management and overview
- Important in any standardisation project
- Essential in a multi-organisation, multi-specification standards project

- ETSI has teams of dedicated Technical Officers to support ETSI TBs, and provide project management
Specify for interoperability!

- ITU-T I.130 3-stage model for protocol specification
  - Used extensively in 3GPP
- Requirements
- Functional architecture and Information Flows
  - Standardise interoperable interfaces, not internal behaviour
- Detailed protocol specification
  - Use most relevant techniques: text, UML, SDL, ASN.1, XML etc.
Validate for interoperability!

- Validation through technical reviews and simulation
- Validation through interoperability events
- Validation through test specification development
Test for interoperability!

- Plan for validation and Plan for testing!
- Conformance Testing and Interoperability Testing
- Use existing methodologies
  - ISO/IEC 9646, TTCN-3, ETSI Interoperability Testing Methodology
- Validate test specifications
Maintain for interoperability!

- Good standards can be broken by poor maintenance
  - Or no maintenance!
- Corrections to be made with care
- Extensions require same process as original development
- Feedback needs to be sought and captured
Conformance Testing and Interoperability

Testing are Complementary

- **ETSI experience**
  - As you move up a system stack the emphasis should change from conformance to IOT
  - Moving from component testing, to more complex interoperability issues

- **Lower layer protocols, infrastructure**
  - Emphasis on conformance

- **Middleware, enablers**
  - Combination of Conformance + IOT

- **Services, applications, systems**
  - Emphasis on IOT

- **Conformance testing as a pre-requisite to IOT**
  - Ensure interoperability through standardised interfaces

- **Interoperability testing with conformance verification**
  - E.g. end-to-end conformance tests with intermediate reference point verification
Specific ETSI initiatives and support for interoperability

- ETSI Board Champion for Interoperability
  - Co-ordination for interoperability issues
- ETSI interoperability workshops
  - Open to members and non-members of ETSI
- ETSI Technical Committee MTS
  - Methods for Testing and Specification
  - Provides frameworks and methodologies to ETSI TBs
- ETSI Protocol and Testing Competence Centre
  - Practical help for ETSI TBs to use latest tools and techniques for specification, validation and testing
- ETSI Plugtests service
  - Organises and runs interop test events
  - Open to members and non-members of ETSI
  - For technologies inside and outside of ETSI
Conclusions

- ETSI places great importance on producing interoperable standards
  - Extensive process and support
- New dangers for interoperability, with new standards projects
  - Technical complexity
  - Partial specifications
  - Many organisations involved
- ETSI continues to seek ways to improve interoperability
  - Process improvements
  - New resources
  - New techniques
  - Not forgetting what has been proven to work!
Thank you!

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Whitepaper can be downloaded from
http://www.etsi.org/etsi_radar/whitepaper/home.htm