Welcome to the World of Standards

ETSI

World Class Standards

SPECIALIST TASK FORCE 505

IOT STANDARDS LANDSCAPING & IOT LSP GAP ANALYSIS

Conclusions, open questions

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Outline

- IoT Standardisation: On solid ground
  - The IoT Landscape
  - Fragmentation?
  - The role of the IoT Platform
- IoT Standardization: Challenges
  - Mapping the gaps
  - Addressing the gaps
  - The role of LSPs, SDOs and Open Source

This presentation is a stimulus for the coming panel discussion

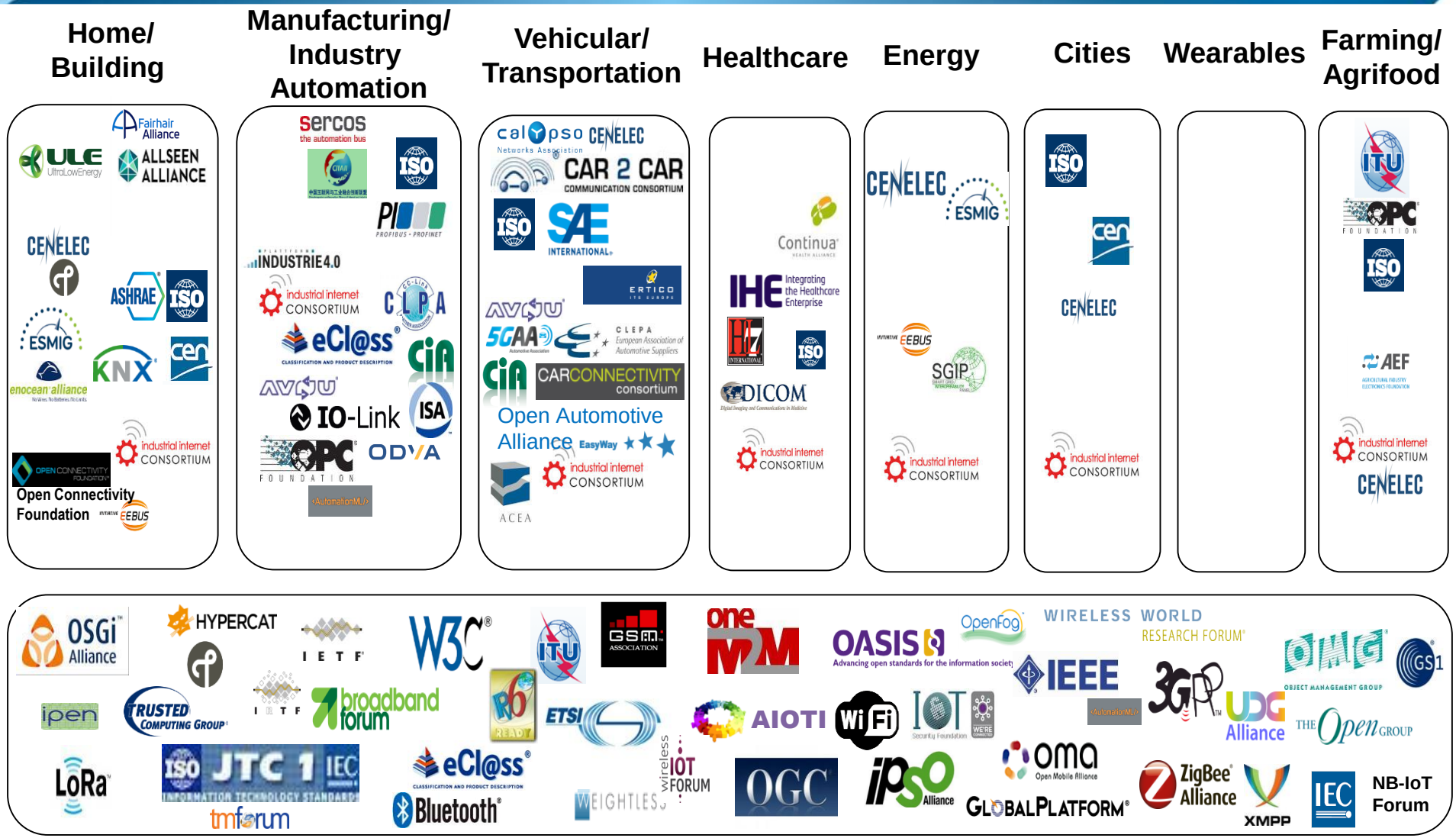
Opinions reflect the author's views, not necessarily the STF 505 ones

STF 505: what we have

- Two Technical Reports: information, facts, analysis
  - TR 103 375
    - Analysing the standards landscape, it provides a list of existing standardised technologies suggested for (re)use by the LSPs
    - A view of what LSPs can based their work on
  - TR 103 376
    - Identifying technical standards/ societal/business gaps as a good indication of the level of maturity of standardization in a given vertical domain
    - A view of which questions LSPs can contribute to resolve
- Points of view
  - On the status of IoT Standardisation (e.g. on fragmentation)
  - On the priorities for the resolution of gaps by the IoT community
- Questions
  - Identification of major challenges for the IoT standards work

IoT SDOs and Alliances Landscape: Simplified

With horizontal orgs taken away from verticals



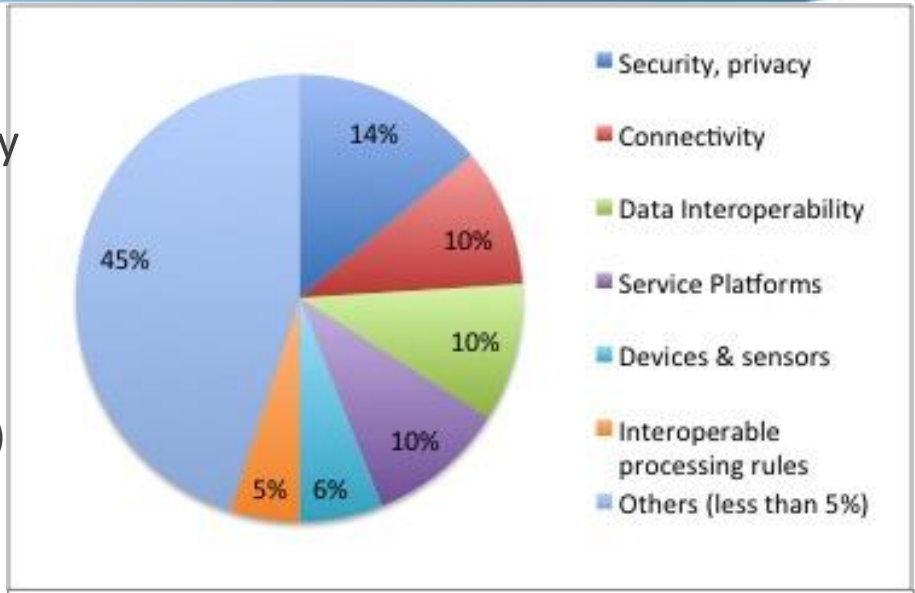
Initial Source:
AIOTI WG3 – Release 2.7

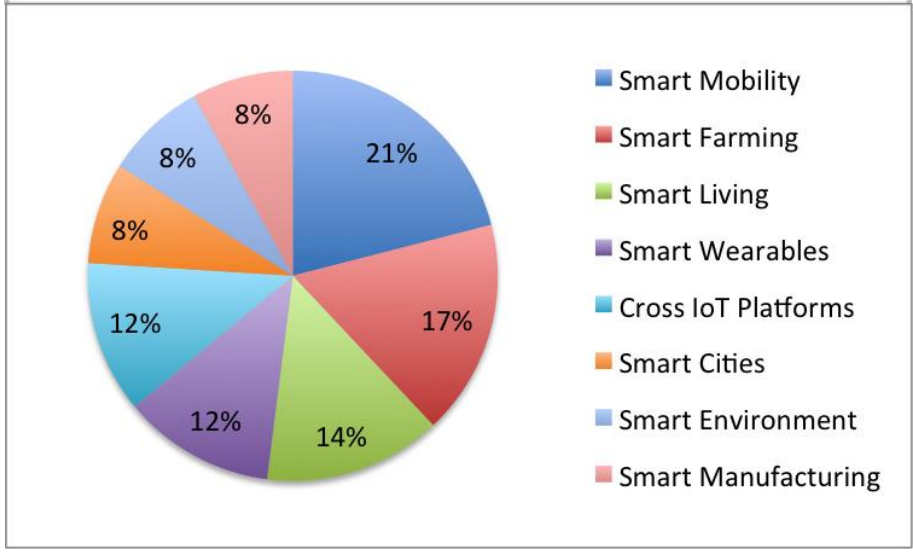
The IoT Standards Landscape

- Enough standards to start with
  - 150 Generic standards; 179 Domain-specific standards
  - 70% in Communication/Connectivity; Architecture; Interoperability
  - Top 3 "verticals": Smart Mobility, Smart Living, Smart Manufacturing
- Reduced fragmentation of the landscape
  - A number of actors in the "horizontal" domain
    - Many existing communication standards apply to IoT
    - A relatively low number of new standards in support of new technologies
      - Some overlaps, but time (and refined use cases) will tell
  - A limited number of actors in the vertical domains
- Good news for LSPs!
  - IoT systems: complex developments in a complex landscape
  - Standards are here to help, not to complicate the design choices

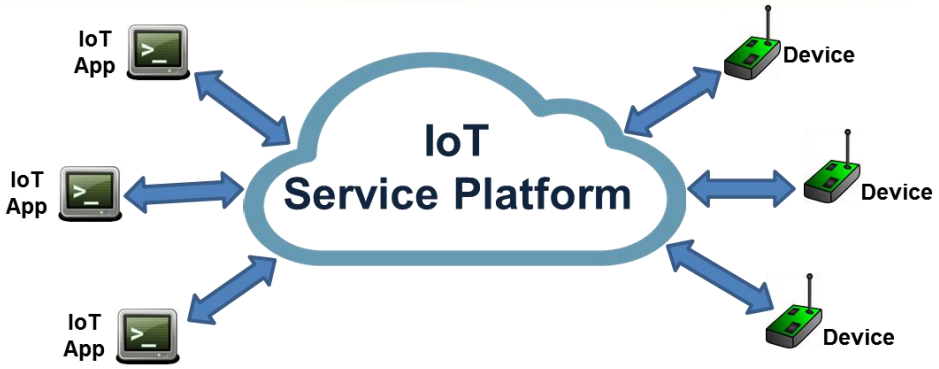
The main gaps

- Gaps in Knowledge Areas
  - The "usual suspects" incl. connectivity
    - Security/Privacy #1 also in IoT
    - Data Interoperability is a strong #2
    - Connectivity
  - The Service Platform(s)
  - Usability (configuration, remote access, ...)
- Gaps in "verticals"
  - In all verticals
  - Various degrees depending on
    - Existing "stock" of standards
    - Complexity
    - Maturity in perception of gaps
- Expectation #1: harmonization
  - Connectivity
  - Data model translation mechanisms
  - Global-level standards





A pivotal question: the IoT service platform



- The IoT service platform
  - A coherent set of standards
  - An underlying architecture
- Platforms versus products
  - Hundred of IoT products
  - Only a handful of service platforms that package multiple standards
- Perception
  - Fragmentation
  - Lack of interoperability
- Expectations / challenges
  - Interoperability from devices to applications
  - High-level support of data interoperability (semantic interoperability)

Challenges
Beyond Connectivity

- Connectivity
  - Multiple communications and networking technologies
    - Difficulty in making a choice based on the standards alone
    - Additional criteria should be considered, such as security, energy, cost
  - Interoperability will impact the choice of the IoT service platform
    - Some platforms have interworking/interoperability in their DNA (e.g. oneM2M)
    - All platforms must support interworking with other platforms (e.g. data exchange)
- And beyond
  - IoT is also about devices
    - Device Management is critical (e.g. for scalability), requires more standard support
    - Standardized approaches to measure, qualify, interpret sensor data
  - IoT is also about applications and object life-cycles
    - More APIs to support application portability over devices (a role for open source?)
    - Standards should help migration of objects through different eco-systems

Challenges
Verticals: how to expand the common ground?

- More support to verticals in the common layer
  - The "data interoperability" gap
    - Lack of easy translation mechanisms between different specific models
    - Global & neutral data model allowing seemless data interoperability needed
  - And the challenge of semantic interoperability
    - Ensuring the development of ontologies by the industries themselves
      - Make sure that practitioners are aware and educated to semantic interop
    - Expanding ontologies beyond their initial domain (e.g. SAREF)
    - Expanding the reach of common ontologies (e.g. oneM2M)

- More possibilities to collaborate between verticals
  - Improved plug & play capabilities between different architectures
  - Cross-doman APIs to support application portability

Challenges
Security and Privacy

- Two potentially "make or break" issues
  - A lot to gain from non IoT-specific approaches (and standards)
  - IoT is (relatively) greenfield and a proper domain for new approaches
- Privacy
  - Data management, stakeholders management, technical guidance
  - Challenge #1: Privacy by design – How can standards help?
- Security
  - A lot of security standards
    - But security is much more than standards (frameworks, guidelines, repositories, ...)
  - Security classes, tagging for devices
  - Challenge #1: Security by Design - How can standards help?
- A global challenge: education
  - Security and Privacy to central/critical to be delegated to specialists

A global effort to address the challenges

- LSPs
  - Choice of the service platform based on use cases fostering interop
    - Ensure that their developments are standardised and usable by other LSPs
  - Beefed-up standardisation plans over their entire lifetime
    - Address the gaps identified in their domain and coordinate with other domains
- SDO/SSOs and Open Source communities
  - A vast program of standardisation is on-going: coordination required
  - Speed and acceptance will be critical factors
    - Early proof of concept and Reference Implementation will be key enablers
    - The Open Source communities are central actors
- AIOTI
  - AIOTI WG3 mission is well centered around the main challenges
  - Cross-WG issues will be addressed jointly (e.g. privacy)
  - A good place for fostering coordination of SDO/SSO and Industries

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And now: time for discussion!