ILNAS

Technical Standardization & Smart Secure ICT

ILNAS' Overview and outlook

28th June 2019

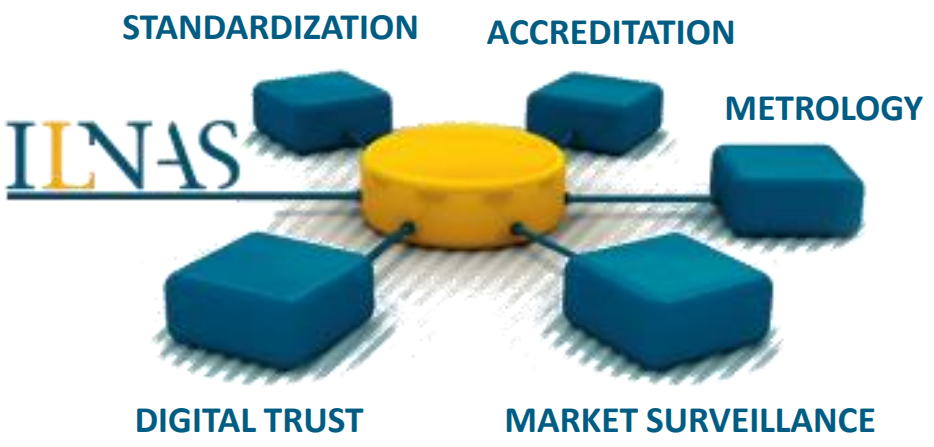
INTRODUCTION OF ILNAS

GENERAL PRESENTATION

ILNAS, Institut luxembourgeois de la normalisation, de l'accréditation, de la sécurité et qualité des produits et services

- **Creation:** law dated July 14, 2014 (repealing the amended Law of May 20, 2008) and law dated February 17, 2017
- **Legal form:** Public administration under the authority of the Minister of the Economy
- **Total staff:** 49 (June 2019)
- **Website:** www.portail-qualite.lu

PORTAIL-QUALITE.LU
QUALITE · SECURITE · CONFORMITE



A FRAMEWORK

– OLN - *Organisme luxembourgeois de normalisation*

- Composed of 6 persons
- Close collaboration with the G.I.E. ANEC-N (6 persons)

A FRAMEWORK

AGENCY FOR STANDARDIZATION AND KNOWLEDGE-BASED ECONOMY

ANEC

- **Creation:** October 4, 2010
- **Status:** Economic Interest Grouping (EIG)
- **Objectives:** Promotion, awareness raising and training, applied research in the field of standardization and metrology in order to support companies' competitiveness in Luxembourg
- **Human resources:** 9 employees (June 2019)
- **Partners:**

ILNAS

CHAMBRE DES METIERS Luxembourg

CHAMBRE DE COMMERCE LUXEMBOURG

LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Économie

TECHNICAL STANDARDIZATION - AIM AND COMMITMENT

NATIONAL STANDARDIZATION STRATEGY

– **THREE PILLARS:**

PILLAR 1	**Information and communication technologies (ICT)**
PILLAR 2	**National influence and compliance with legal attributions**
PILLAR 3	**Products and services**

- https://portail-qualite.public.lu/fr/publications/normes-normalisation/avis-officiels/strategie-normative-2014-2020.html

TECHNICAL STANDARDIZATION - AIM AND COMMITMENT

NATIONAL STANDARDIZATION STRATEGY

Pillar 1: Information and communication technologies (ICT)

1. Developing the interest and the involvement of the market
2. Promoting and reinforcing market participation
3. Supporting and strengthening the EaS and related research activities

- https://portail-qualite.public.lu/fr/publications/normes-normalisation/avis-officiels/strategie-normative-2014-2020.html
- https://portail-qualite.public.lu/fr/publications/normes-normalisation/avis-officiels/politique-luxembourgeoise-pour-la-normalisation-technique-des-TIC-2015-2020.html

A FRAMEWORK

– Digital Trust Department

- Composed of 4 persons
- National digital trust supervisory body

SMART SECURE ICT - OVERVIEW

WHITE PAPER « DIGITAL TRUST FOR SMART ICT » - SEPTEMBER 2017 – THE BASELINE

It surveys current advances in Digital Trust from three complementary points of view:

- A technical analysis
- A business and economic prospective analysis
- A technical standardization perspective

From the technical analysis

- It reviews the basic concepts of the technology and the existing work supporting the development of Digital Trust
- It presents some technical challenges related to Digital Trust

From business and economic prospective

- It highlights the interest for Digital Trust
- It stresses the need of Digital Trust for each Smart ICT concepts

From standards point of view technical standardization

- It considers both as an important tool to support Digital Trust for Smart ICT

- https://portail-qualite.public.lu/content/dam/qualite/publications/confiance-numerique/white-paper-digital-trust-september-2017.pdf

SMART SECURE ICT - OVERVIEW

WHITE PAPERS ON SMART ICT

- **White Paper "Blockchain and Distributed Ledgers - Technology, Economic Impact and Technical Standardization" – June 2018**
  - Developed with the support of the Ministry of the Economy
  - Provides a comprehensive analysis of the developments in the areas of blockchain and distributed ledger technologies
  - Published on June 23, 2018 – Organization of an event at the Ministry of the Economy
  - 2 more events organized at ILNAS premises to answer market demand

- **White Paper "Internet of Things (IoT) - Technology, Economic View and Technical Standardization" – July 2018**
  - Developed with the support of the Ministry of the Economy
  - Provides a broad view of the developments around IoT and related technologies
  - Published on July 06, 2018 during the ILNAS-ETSI Workshop

- **White Paper "Data Protection and Privacy in Smart ICT" – October 2018**

- **All the White Papers are going to be updated during 2019-2020**

- https://portail-qualite.public.lu/dam-assets/publications/normalisation/2018/white-paper-blockchain-june-2018.pdf
- https://portail-qualite.public.lu/dam-assets/publications/normalisation/2018/white-paper-iot-july-2018.pdf

SMART SECURE ICT - OVERVIEW

STANDARDS ANALYSIS "SMART SECURE ICT"

Developing the interest and the involvement of the market in ICT Technical Standardization

- **Drawing up a yearly national standards analysis for the ICT sector**
  - Standards watch of the related sector
  - Identification of relevant technical committees and Fora/Consortia
  - Preparation of the final report of analysis and opportunities
  - **FOCUS ON SMART ICT AND DIGITAL TRUST**
    - Cloud Computing, Internet of Things, Big Data, Artificial Intelligence, Blockchain, Digital Trust related developments

- **Defining a national implementation plan for ICT technical standardization**
  - To involve targeted stakeholders of the Grand Duchy of Luxembourg in a global approach to standardization
  - Enhancing the international recognition of the Grand Duchy of Luxembourg

SMART SECURE ICT - OVERVIEW

RESEARCH PROGRAM ILNAS-UNIVERSITY OF LUXEMBOURG (IOT, CLOUD COMPUTING, BIG DATA)

The University of Luxembourg and ILNAS are strengthening their collaboration in the field of Smart ICT and standardization. A ceremony was held on May 17, 2017 at the Ministry of Economy to formally conclude the partnership

In the rear row, from left to right: Jean-Philippe Humbert, Pascal Bouvry, Paul Heuschling, Yves Elsen, Björn Ottersten;
In the front row, from left to right: Ludwig Neyses, Francine Closener, Jean-Marie Reiff

SMART SECURE ICT - OVERVIEW

Research Program (2017-2020) on "Digital Trust for Smart ICT"

- **Joint collaboration between ILNAS & SnT-UL to reinforce the collaboration in the domain of Smart ICT for Business Innovation through Technical Standardization**
  - Partnership and contract between ILNAS and SnT have been signed in March 2017

ILNAS

SnT

securityandtrust.lu

- **3 PhD students are involved in "Digital Trust for Smart ICT"**
  - Cloud Computing
  - Big Data and Analytics
  - Internet of Things

- **Supported the evolution of the University certificate course program for the class 2018-2019**

- **Other main targets of the research program**
  - To serve as a basis for the development of the "Master in Technopreneurship: mastering smart ICT, standardisation and digital trust for enabling next generation of ICT solutions"
  - To update the White Paper "Digital trust in Smart ICT"
    - ❑ Update 2018 on Privacy (common problematic to the three Smart ICT domains: Cloud Computing, Big Data and Internet of Things), in collaboration with the Ministry of the Economy → White Paper on "Data Protection and Privacy in Smart ICT" (DPP)
    - ❑ Update 2019 - Evolution of the White Paper DPP

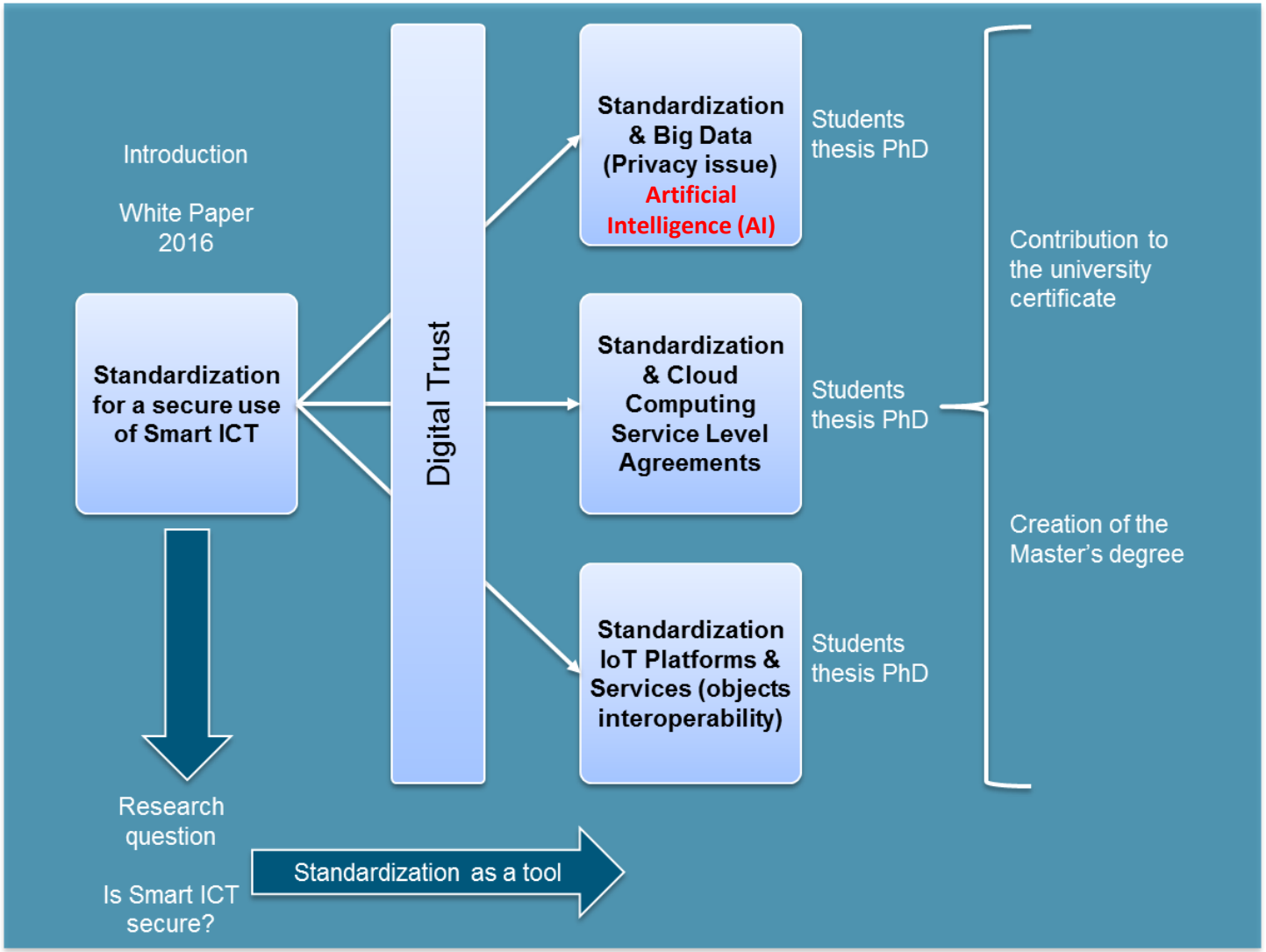
SMART SECURE ICT - OVERVIEW

RESEARCH PROGRAM ILNAS-UNIVERSITY OF LUXEMBOURG (IOT, CLOUD COMPUTING, BIG DATA)

ILNAS

SnT

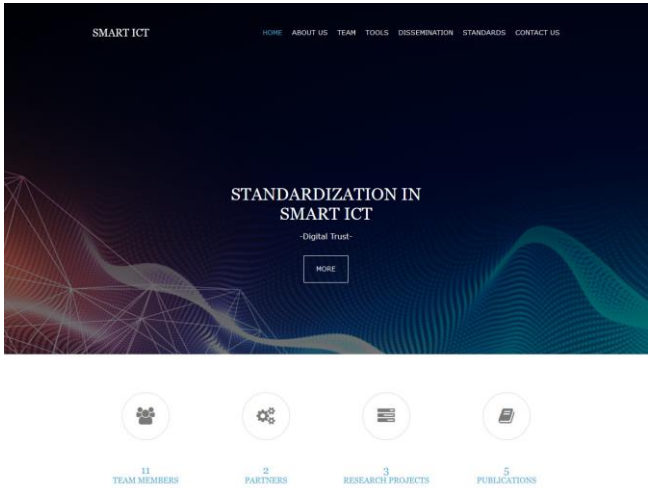
securityandtrust.lu

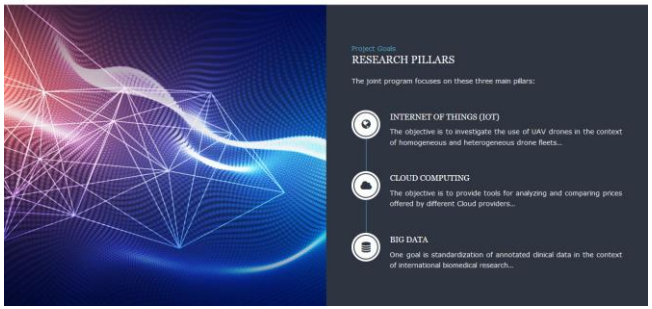


SMART SECURE ICT - OVERVIEW

RESEARCH PROGRAM ILNAS-UNIVERSITY OF LUXEMBOURG (IOT, CLOUD COMPUTING, BIG DATA)

Research Program Website (UL) - https://smartict.gforge.uni.lu/

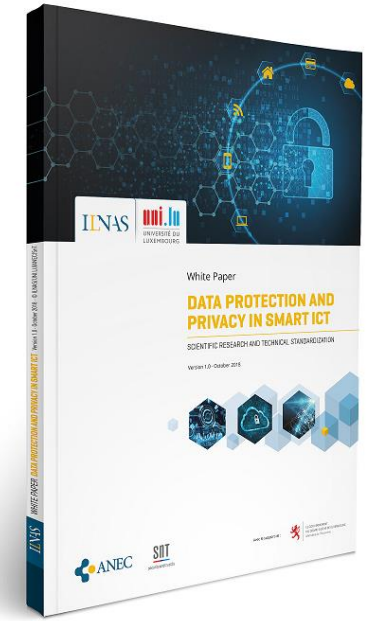




SMART SECURE ICT - OVERVIEW

RESEARCH PROGRAM ILNAS-UNIVERSITY OF LUXEMBOURG (IOT, CLOUD COMPUTING, BIG DATA)

White Paper "DATA PROTECTION AND PRIVACY IN SMART ICT - SCIENTIFIC RESEARCH AND TECHNICAL STANDARDIZATION"



https://portail-qualite.public.lu/dam-assets/publications/normalisation/2018/White-Paper-Data-Protection-Privacy-Smart-ICT-october-2018.pdf

- **First result of the Research Program**
  - White Paper "Data Protection & Privacy in Smart ICT"
  - Common development between ILNAS and the University of Luxembourg with the support of the Ministry of the Economy
  - Published on 12th October 2018 (World Standards Day)
- **For better understanding of Data Protection and Privacy in Smart ICT Data**
  - Scientific and technological challenges
  - Economic potential
  - Understanding related standardization needs and efforts
- **Objective**
  - Analyze the state-of-the-art from research and technical standardization perspectives
  - One of the goals of performing this analysis is to understand the links between research and standardization

SMART SECURE ICT - OVERVIEW

RESEARCH PROGRAM ILNAS-UNIVERSITY OF LUXEMBOURG (IOT, CLOUD COMPUTING, BIG DATA)

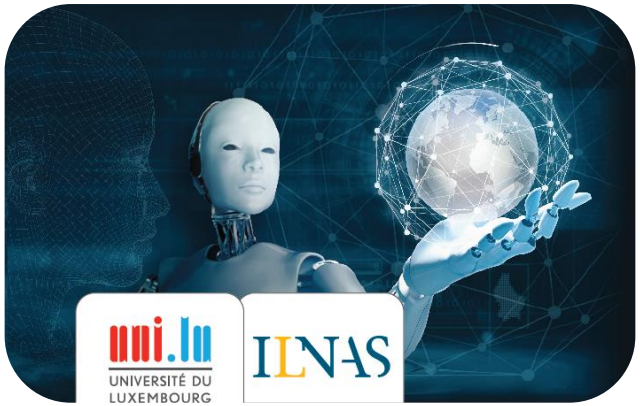
IS Day 2019 - Information Security Awards

- **Security Project of the Year: SnT – ILNAS**
  - "*Technical Standardisation for Trusted Use in the Field of Smart ICT*"
    - For designing an adaptable and localized clustering algorithm that provides existing machine learning techniques with privacy preserving features

SMART SECURE ICT - OUTLOOK

MASTER IN TECHNOPRENEURSHIP: MASTERING SMART ICT, STANDARDISATION AND DIGITAL TRUST FOR ENABLING NEXT GENERATION OF ICT SOLUTIONS

Strengthening ILNAS' relations with academic partners with the aim of structuring education about standardization and ad-hoc research in the Grand Duchy of Luxembourg

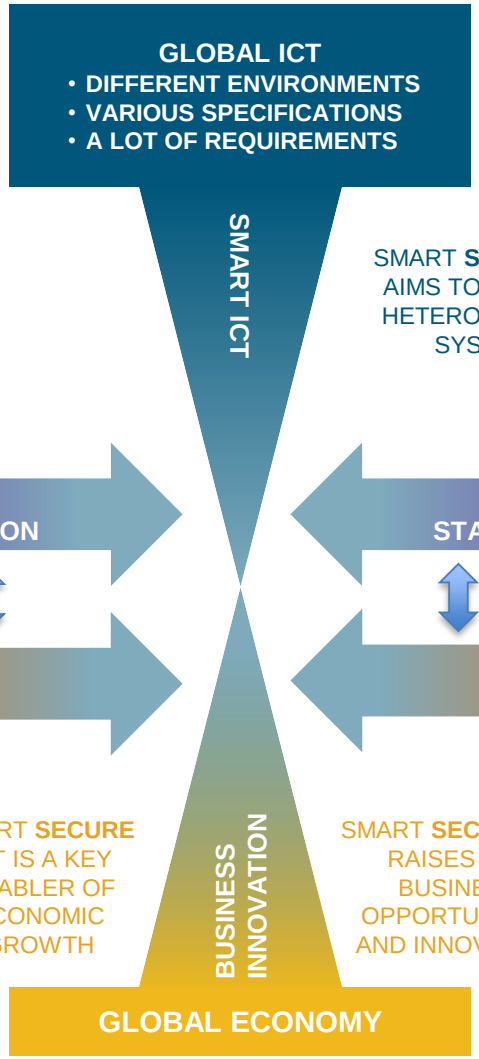


- **Origin:**
  - Pilot project conducted between September 2015 and September 2016: "Smart ICT for Business Innovation" university certificate in partnership with the University of Luxembourg
  - Second promotion: February 2018 to February 2019
- **Objective: University Master on technical standardization and digital trust (objective: September 2020)**
  - Will answer national priorities related to "Smart Secure ICT" topics, providing a smart way to link technology, standards and the business world, while creating an additional means of innovation at the national level

SMART SECURE ICT - OUTLOOK

MASTER IN TECHNOPRENEURSHIP: MASTERING SMART ICT, STANDARDISATION AND DIGITAL TRUST FOR ENABLING NEXT GENERATION OF ICT SOLUTIONS

- **(NEW) READING GRID**



EFFECTIVENESS AND GROWTH OF THE ICT INDUSTRY ARE DETERMINED BY THE ABILITY OF THE COMPONENT PARTS TO **SECURELY** "TALK" TO EACH OTHER – TO INTEROPERATE

TECHNICAL STANDARDIZATION:

- COMMON LANGUAGES
- INTERNATIONAL OUTCOMES
- CONSENSUS
- BUSINESS-DRIVEN

A FORCE MULTIPLIER FOR ICT INNOVATION …

SMART SECURE ICT - OUTLOOK

MASTER IN TECHNOPRENEURSHIP: MASTERING SMART ICT, STANDARDISATION AND DIGITAL TRUST FOR ENABLING NEXT GENERATION OF ICT SOLUTIONS

New Digital Trust Layer

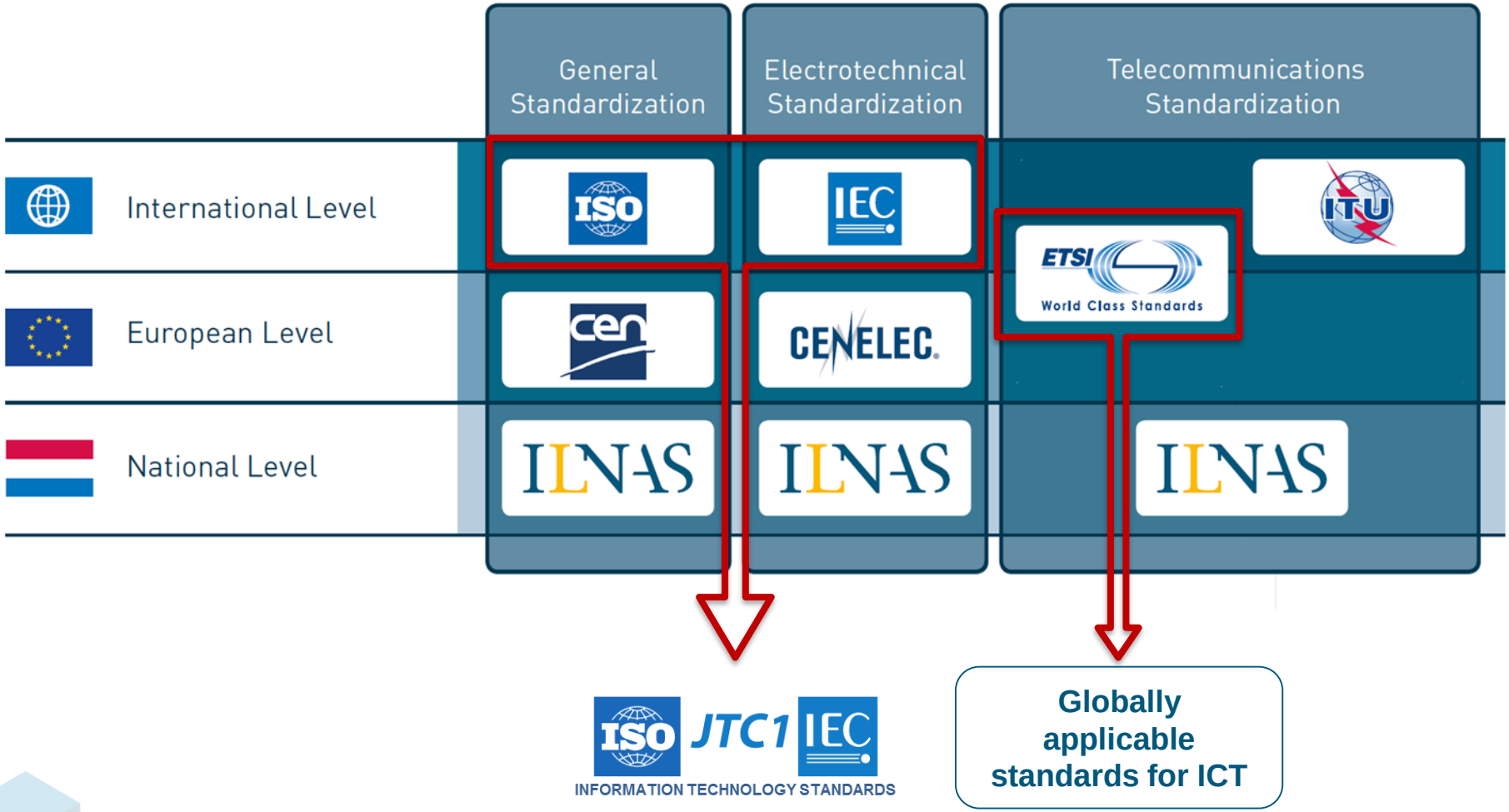
- **Smart ICT is fueling new business models, opportunities and innovation at large**
  - This domain becomes less tangible, more distributed, and more vulnerable to (cyber) threats and attacks
  - Digital Trust must be an essential part of Smart ICT

- **Digital Trust indicates a positive and verifiable belief about the perceived reliability of a digital information source, product or service, leading to an intention to use. It is not a technology, nor a process, it is an outcome exemplified by:**
  - Reliability
  - Accountability
  - Privacy
  - Transparency
  - Security
  - Quality
  - Integrity
  - …

- **Attainment of Digital Trust is driven by how Smart ICT technologies are both secured and used, and it helps to increase the broad adoption of innovative services, products, and the Smart ICT technologies → SMART SECURE ICT**
  - Digital Trust for Cloud Computing
  - Digital Trust for IoT
  - Digital Trust for Artificial Intelligence
  - Digital Trust for Big Data
  - …

SMART SECURE ICT - AN ECOSYSTEM

INFORMATION TECHNOLOGY



SMART SECURE ICT - AN ECOSYSTEM

ETSI MEMBERS IN LUXEMBOURG

ETSI World Class Standards

- **12 ETSI members in Luxembourg:**

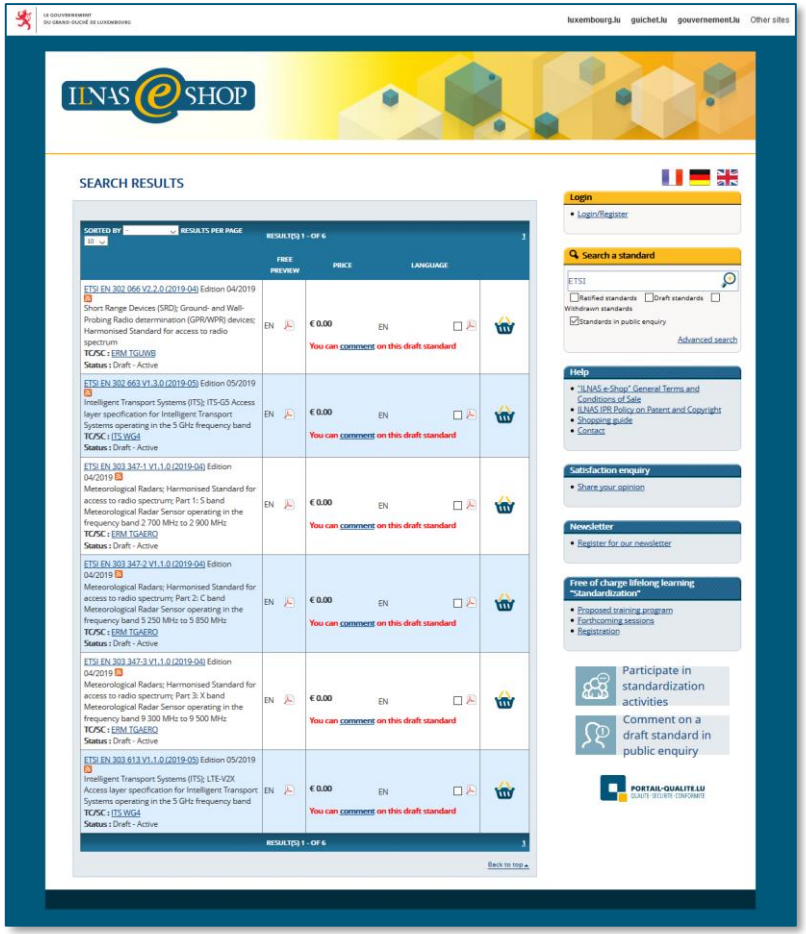
ILNAS
ANEC
conversant
2witness Certezze Digitali
FBCONSULTING THINK WIRELESS FOR TOMORROW
LUXTRUST
POST LUXEMBOURG Technologies
Nowina SOLUTIONS
SES your satellite company
WE PROTECT IDEAS
SISVEL
SKYLANE optics
SNT securityandtrust.lu

SMART SECURE ICT - AN ECOSYSTEM

ILNAS INVOLVEMENT IN ETSI

ETSI World Class Standards

- **ILNAS is a full member of ETSI**
  - Participates to the bi-annual ETSI National Standards Organization (NSO) meetings
  - Participates to the bi-annual ETSI General Assembly (GA) meetings
  - Organizes Public Enquiries on draft ETSI EN standards at national level
    - Drafts available on the ILNAS eShop
  - Transposes ETSI EN standards at national level (publication in the *Journal Officiel du Grand-Duché de Luxembourg*)
  - Makes available all ETSI standards in the ILNAS e-Shop → https://ilnas.services-publics.lu/



SMART SECURE ICT - AN ECOSYSTEM

ILNAS INVOLVEMENT IN ETSI TECHNICAL WORK

ETSI World Class Standards

- **ILNAS follows some technical areas of particular interest – Examples:**

  - **ETSI/TC CYBER - Cyber Security**
    - Responsible for standardization in the area of Cyber Security

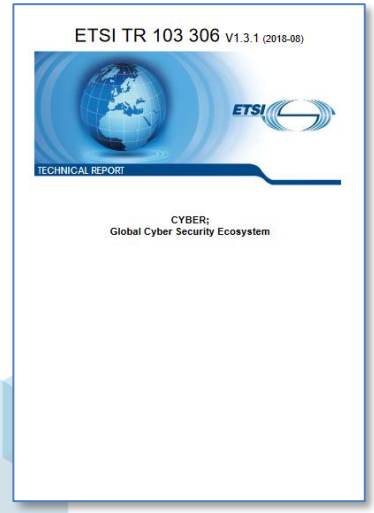
  - **ETSI/TC ESI - Electronic Signatures and Infrastructures**
    - Responsible for standardization supporting technology Electronic Signatures and related services (e.g. registered electronic delivery, electronic seals) as well as trust service infrastructures supporting such services
      - Supports regulatory requirements such as the eIDAS Regulation as well as general commercial requirements
      - Standards used by the Digital Trust department of ILNAS to supervise trust service providers

SMART SECURE ICT - AN ECOSYSTEM

EXAMPLES OF ETSI STANDARDS IN THE CYBERSECURITY AREA

ETSI World Class Standards

- **ETSI TR 103 306 V1.3.1 (2018-08) ”CYBER; Global Cyber Security Ecosystem“**
  - Scope: Provides a structured overview of cyber security work occurring in multiple other technical forums worldwide
    - Includes global identification of Cyber Security Centres of Excellence, heritage sites, historical collections, and reference libraries
    - It is intended to be continuously updated to account for the dynamics of the sector



» https://www.etsi.org/deliver/etsi_tr/103300_103399/103306/01.03.01_60/tr_103306v010301p.pdf

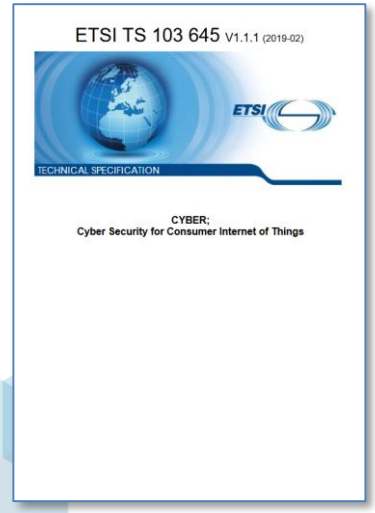
Luxembourg

Luxembourg's Cyber Security Strategy and additional material are available through the NATO Cooperative Cyber Defence Center of Excellence.

- **ANSSI** - Agence nationale de la sécurité des systèmes d'information. ANSSI is the national authority with respect to security of classified and unclassified information systems established and operated by the government and the operators of critical infrastructures for their own purposes. Its mission is to define policies and guidelines for the security of classified and unclassified information, and to ensure that the necessary measures regarding the security of information systems are implemented and that their application is guaranteed. ANSSI operates the national and governmental CERT.
- **CERT.LU** - Grouping of all Luxembourg CERTs.
- **CIRCL** - The Computer Incident Response Center Luxembourg (CIRCL) is a government-driven initiative designed to provide a systematic response facility to computer security threats and incidents. CIRCL is the CERT for the private sector, communes and non-governmental entities in Luxembourg. CIRCL provides a reliable and trusted point of contact for any users, companies and organizations of its constituency, for the handling of attacks and incidents.
- **GovCERT** - CERT gouvernemental du Grand-Duché de Luxembourg (GOVCERT.LU). GOVCERT is the single point of contact dedicated to the treatment of all significant computer related incidents jeopardizing the information systems of the government and defined critical infrastructure operators operating in Luxembourg, whether they are public or private. As national CERT it acts as the official national point of contact for natural and legal persons, entities and bodies, both national and international.
- **Healthnet CSIRT** - HealthNet is a telematics platform dedicated to the health sector, which aims to provide health professionals and institutions in the sector: infrastructure allowing them to communicate securely, electronic basic services like email exchanges and internet access, specialized applications for the exchange of results of medical tests, the double reading and program coordination mammography and the future of telemedicine applications such as teleradiology, telepathology and telemonitoring.
- **ILNAS** - The Luxembourg institute for standardisation, accreditation, safety, and quality of goods and services (ILNAS, "Institut Luxembourgeois de la Normalisation, de l'Accréditation, de la Sécurité et qualité des produits et services") is the national standards body, representing the Luxembourg interests in European and international standards organizations. In the frame of the national ICT Technical Standardization Policy (https://portail-qualite.public.lu/content/dam/qualite/fr/publications/normes-normalisation/orientations-strategiques/politique-luxembourgeoise-pour-la-normalisation-technique-des-tic-2015-2020/policy-ict-technical-standardization-2015-2020.pdf), ILNAS is developing and supporting the promotion of digital trust domain and related technical standardization (https://portail-qualite.public.lu/content/dam/qualite/publications/confiance-numerique/white-paper-digital-trust-september-2017.pdf).
- **ILNAS**, via the "Digital trust department", is also charged with the supervision of QTSPs (Qualified Trust Service Providers) that are established in the Grand Duchy of Luxembourg and offer qualified trust services, and of PSDCs ("Prestataires de services de dématérialisation ou de conservation") that are established in the Grand Duchy of Luxembourg and offer services related to digitization or e-archiving of documents.
- **Restena CSIRT** - RESTENA CSIRT represents the research and educational community of Luxembourg. The RESTENA Foundation brings together all types of research and teaching bodies, as well as the ministries for education, research and of finance. The primary objective is to provide network services for all public and private institutions involved in the field of education, research and administration, providing them with cutting-edge solutions for their communication needs. The Foundation also co-ordinates Internet resources nationally, by managing the registry for .LU domain names and by actively participating in the operation of the neutral platform for the exchange of Internet traffic LU-CIX.

ETSI World Class Standards

- **ETSI TS 103 645 V1.1.1 (2019-02) ”CYBER; Cyber Security for Consumer Internet of Things”**
  - Scope: specifies high-level provisions for the security of consumer devices that are connected to network infrastructure, such as the Internet or home network, and their associated services
  - Include for example:
    - Connected children's toys and baby monitors
    - Smart cameras, TVs and speakers
    - Wearable health trackers
    - Connected appliances
    - Etc.



» https://www.etsi.org/deliver/etsi_ts/103600_103699/103645/01.01.01_60/ts_103645v010101p.pdf

Table A.1: Implementation of provisions for consumer IoT security

	Clause number and title		
Reference	**Status**	**Support**	**Detail**
4.1 No universal default passwords			
Provision 4.1-1	M		
4.2 Implement a means to manage reports of vulnerabilities			
Provision 4.2-1	M		
Provision 4.2-2	R		
Provision 4.2-3	R		
4.3 Keep software updated			
Provision 4.3-1	R		
Provision 4.3-2	R		
Provision 4.3-3	M C (see note 1)		
Provision 4.3-4	M C (see note 1)		
Provision 4.3-5	R C (see note 1)		
Provision 4.3-6	R C (see note 1)		
Provision 4.3-7	R C (see note 1)		
Provision 4.3-8	R C (see note 2)		
Provision 4.3-9	R C (see note 2)		
4.4 Securely store credentials and security-sensitive data			
Provision 4.4-1	M		
4.5 Communicate securely			
Provision 4.5-1	R		
Provision 4.5-2	R		
4.6 Minimize exposed attack surfaces			
Provision 4.6-1	R		
Provision 4.6-2	R		
Provision 4.6-3	R		
Provision 4.6-4	R		
Provision 4.6-5	R		
4.7 Ensure software integrity			
Provision 4.7-1	R		
Provision 4.7-2	R		
4.8 Ensure that personal data is protected			
Provision 4.8-1	M		
Provision 4.8-2	M		
Provision 4.8-3	M		
4.9 Make systems resilient to outages			
Provision 4.9-1	R		
Provision 4.9-2	R		
Provision 4.9-3	R		
4.10 Examine system telemetry data			
Provision 4.10-1	R C (see note 3)		
Provision 4.10-2	R C (see note 3)		
Provision 4.10-3	M C (see note 3)		
4.11 Make it easy for consumers to delete personal data			
Provision 4.11-1	R		
Provision 4.11-2	R		
Provision 4.11-3	R		
4.12 Make installation and maintenance of devices easy			
Provision 4.12-1	R		
4.13 Validate input data			
Provision 4.13-1	M		

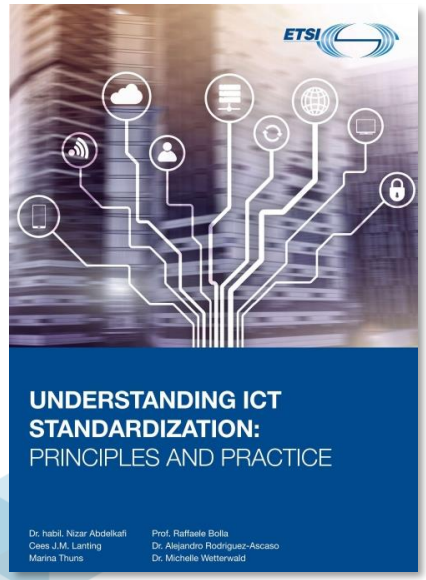
NOTE 1: Provisions 4.3-3, 4.3-4, 4.3-5, 4.3-6 and 4.3-7 are conditional on software components being updateable.
NOTE 2: Provisions 4.3-8 and 4.3-9 are conditional on the inability to update the software of constrained devices.
NOTE 3: Provisions 4.10-1, 4.10-2 and 4.10-3 are conditional on telemetry data being collected.

SMART SECURE ICT - AN ECOSYSTEM

EDUCATION ABOUT STANDARDIZATION - COLLABORATION BETWEEN ILNAS AND ETSI

- **Collaboration in the frame of the University certificate "Smart ICT for Business Innovation"**
  - Supporting organization of the certificate
  - Giving some lectures on ICT standardization

- **Support for the development of the University Master on technical standardization and digital trust**



→ ETSI has developed a comprehensive textbook, "Understanding ICT Standardization: Principles and Practice", together with an extensive set of over 380 slides to be for teaching standardization to students (https://www.etsi.org/about/our-expertise#mytoc6)


ETSI World Class Standards

THE STANDARD

MADE IN EUROPE FOR GLOBAL USE

ETSI Newsletter • September 2015

ILNAS, University of Luxembourg and ETSI strengthen collaboration on education about standardization

Innovative smart ICT certificate supported by ETSI starts as of September

Left to right : Dr. Johnatan PECERO [GIE ANEC - Agence pour la normalisation et l'économie de la connaissance], Dr. Hermann BRAND [ETSI], Mr. Nicolas DOMENJOUD [GIE ANEC - Agence pour la normalisation et l'économie de la connaissance], Prof. Dr. Pascal BOUVRY [University of Luxembourg], Dr. Jean-Philippe HUMBERT [ILNAS], Mr. Alain WAHL [ILNAS]

Technical standardization plays a crucial role in smart Information and Communication Technology (ICT), not only giving a first-hand insight into latest developments, thus supporting innovation, but also contributing to harmonization of systems and procedures, opening access to external markets and ensuring constant progress. In the frame of developing a standardization culture at national level, specifically in an economically meaningful field[1], Luxembourg's standards body (ILNAS), in partnership with the University of Luxembourg (UL), has developed a smart ICT oriented certificate (lifelong training framework) at the end of 2014. UL will welcome the very first class this academic year in September.

the University of Luxembourg to help students with boosting their smart ICT skills, and therefore being able to take on new responsibilities as well as to seize career opportunities within their organizations.

Programme Structure

SMART SECURE ICT - AN ECOSYSTEM

- **ISO/IEC JTC 1 – Information technology**
  - JTC 1 is the standards development environment where experts come together to develop worldwide Information and Communication Technology (ICT) standards for business and consumer applications
- **ILNAS**
  - Presidency of the National Mirror Committee
  - Participation in the annual Plenary Meetings
  - The Grand-Duchy of Luxembourg is Participating Member (P-Member)
  - Transmission of relevant information to the market
  - Use of relevant information to develop "Education and research" in standardization
  - Enhances the visibility of the Grand Duchy of Luxembourg at international level / ICT technical standardization
  - Stronger positioning to vote and comment standardization projects
  - Added value for the digital and general economy

ISO/IEC JTC 1 - A technical committee in constant evolution to follow the technological progress and answer market needs

ISO/IEC JTC 1/SC 38
"Cloud computing and distributed platforms"

ISO/IEC JTC 1/SC 40
"IT Service Management and IT Governance"

ISO/IEC
JTC 1/WG 11
"Smart Cities"

ISO/IEC
JTC 1/SC 42
"Artificial Intelligence"

ISO/IEC
JTC 1/AG 11
"Digital Twin"

November 2009 — November 2011 — November 2013 — November 2014 — October 2015 — November 2016 — November 2017 — November 2018 — May 2019

ISO/IEC JTC 1/SC 39
"Sustainability for and by Information Technology"

ISO/IEC
JTC 1/WG 9
"Big Data"

ISO/IEC
JTC 1/WG 10
"Internet of Things"

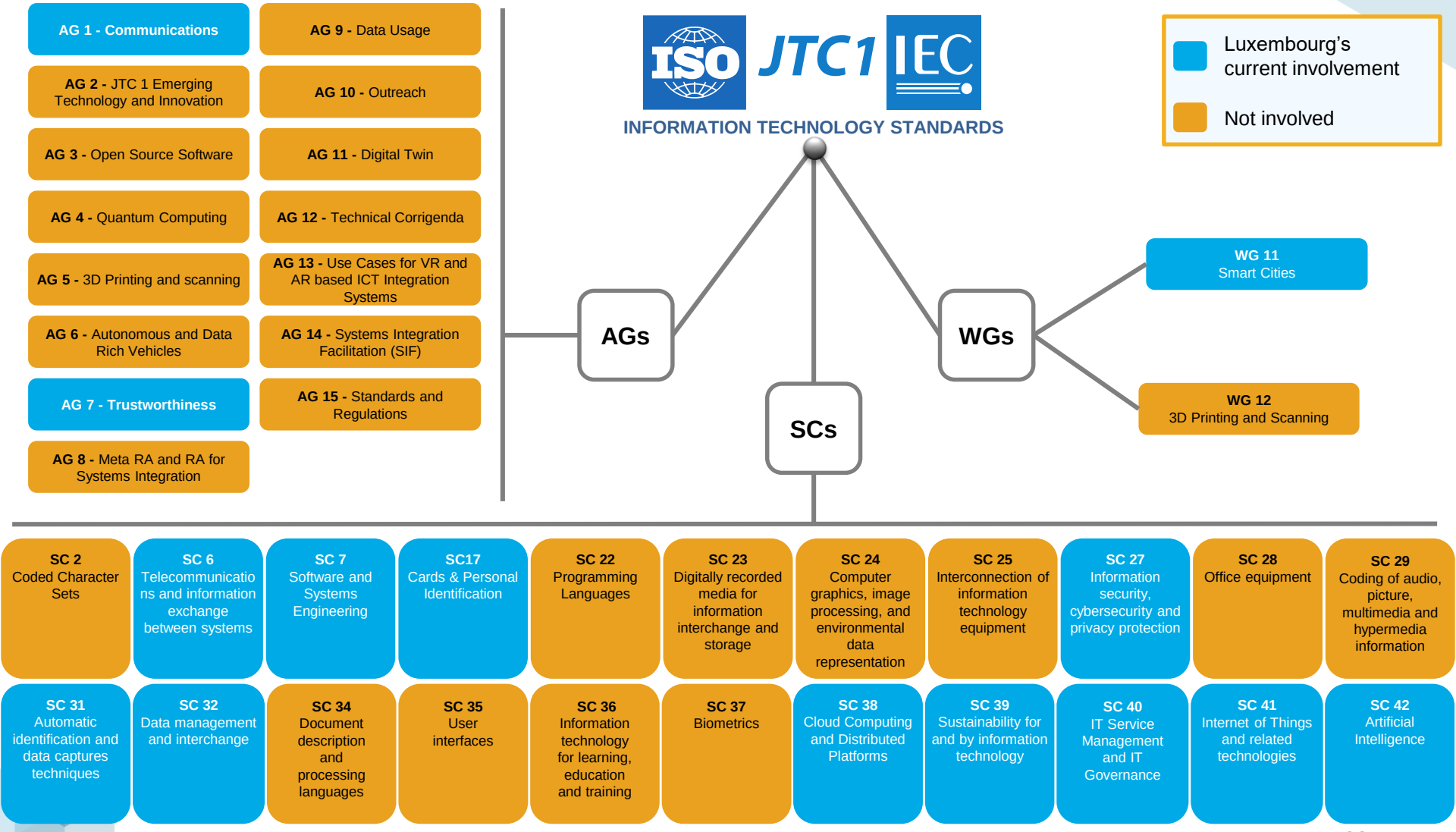
ISO/IEC
JTC 1/SC 41
"Internet of Things"

ISO/IEC
JTC 1/WG 12
"3D Printing and Scanning"

ISO/IEC
JTC 1/AG 4
"Quantum Computing"

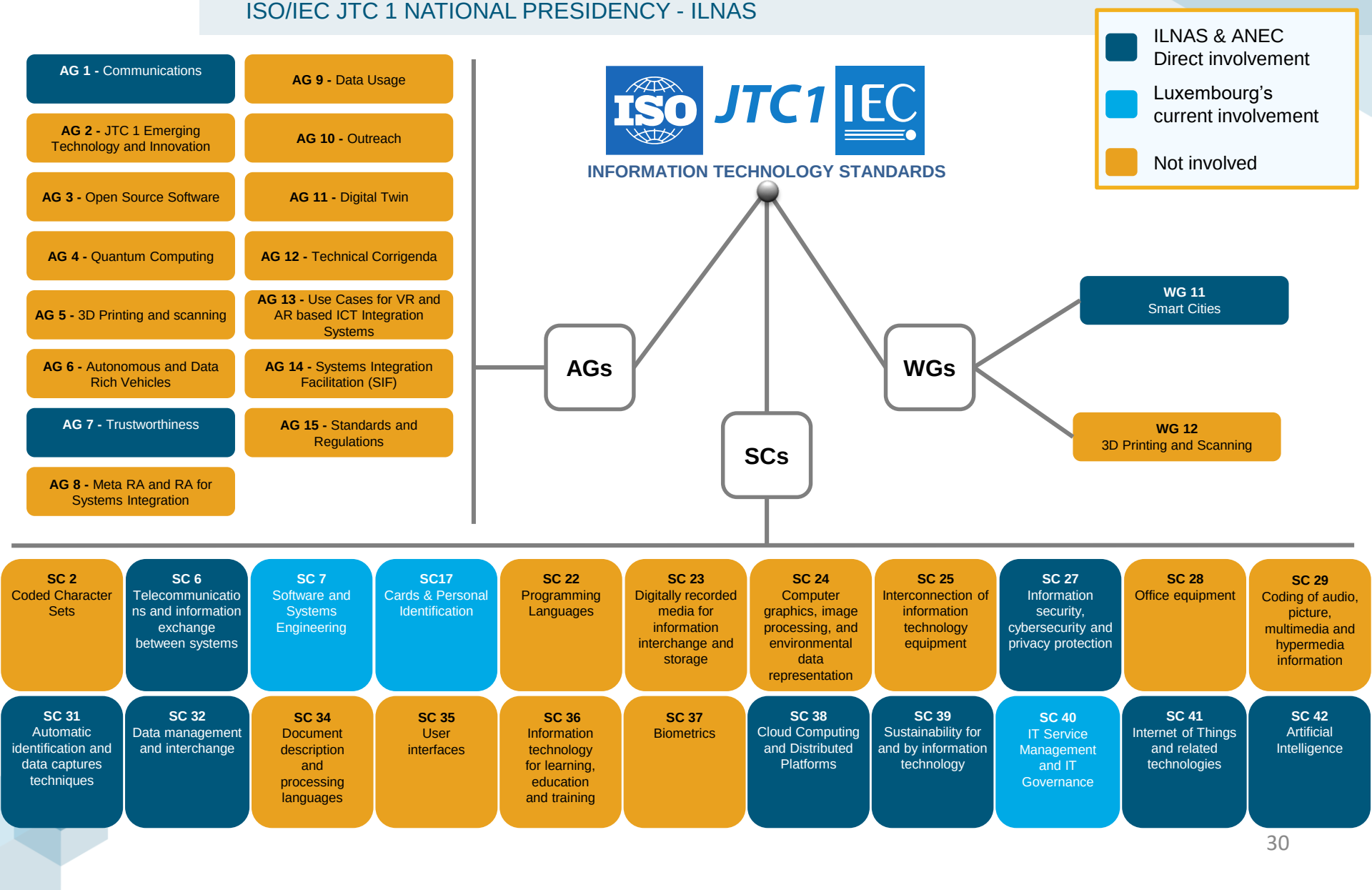
SMART SECURE ICT - AN ECOSYSTEM

ISO/IEC JTC 1 NATIONAL PRESIDENCY - ILNAS

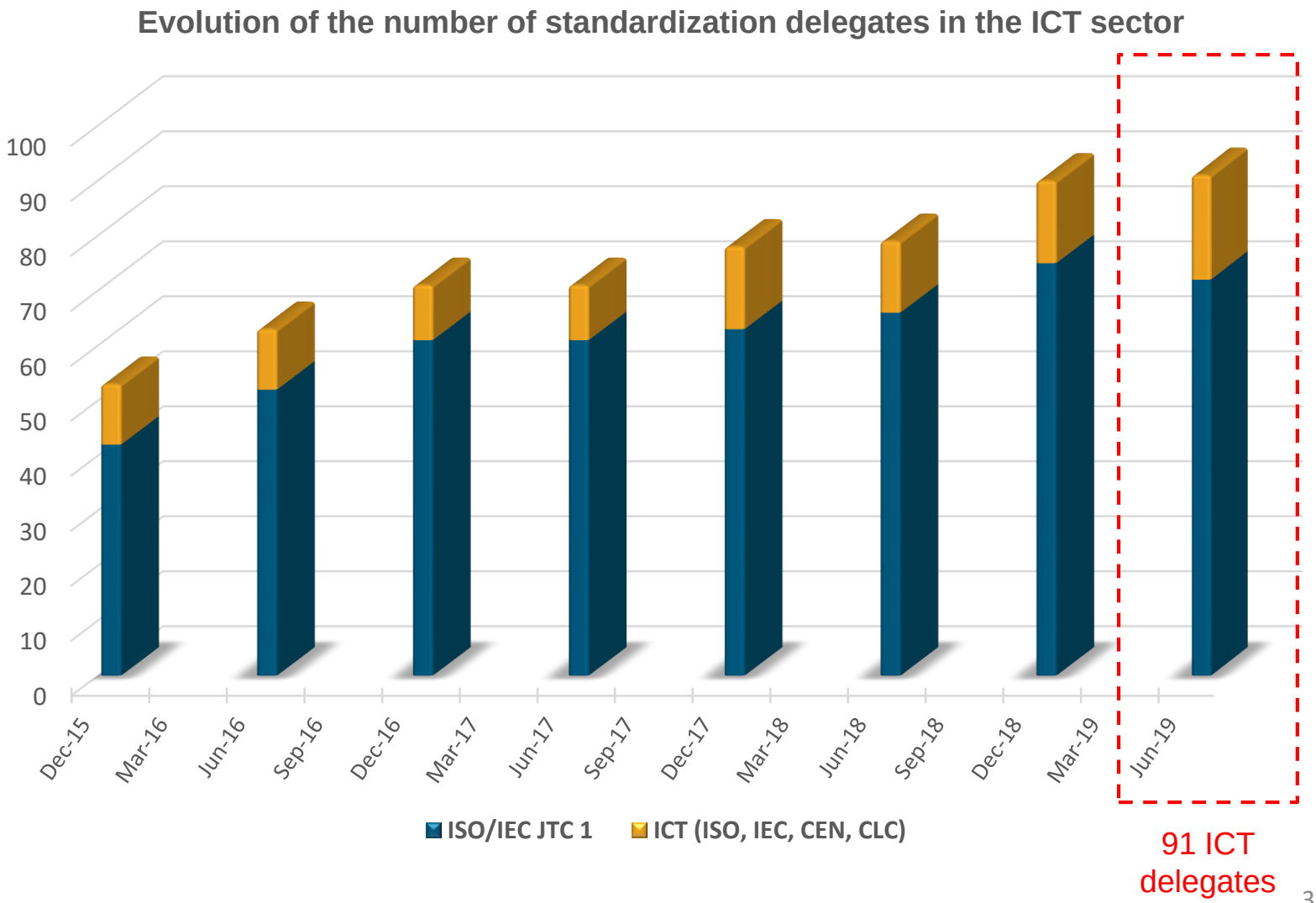


SMART SECURE ICT - AN ECOSYSTEM

ISO/IEC JTC 1 NATIONAL PRESIDENCY - ILNAS



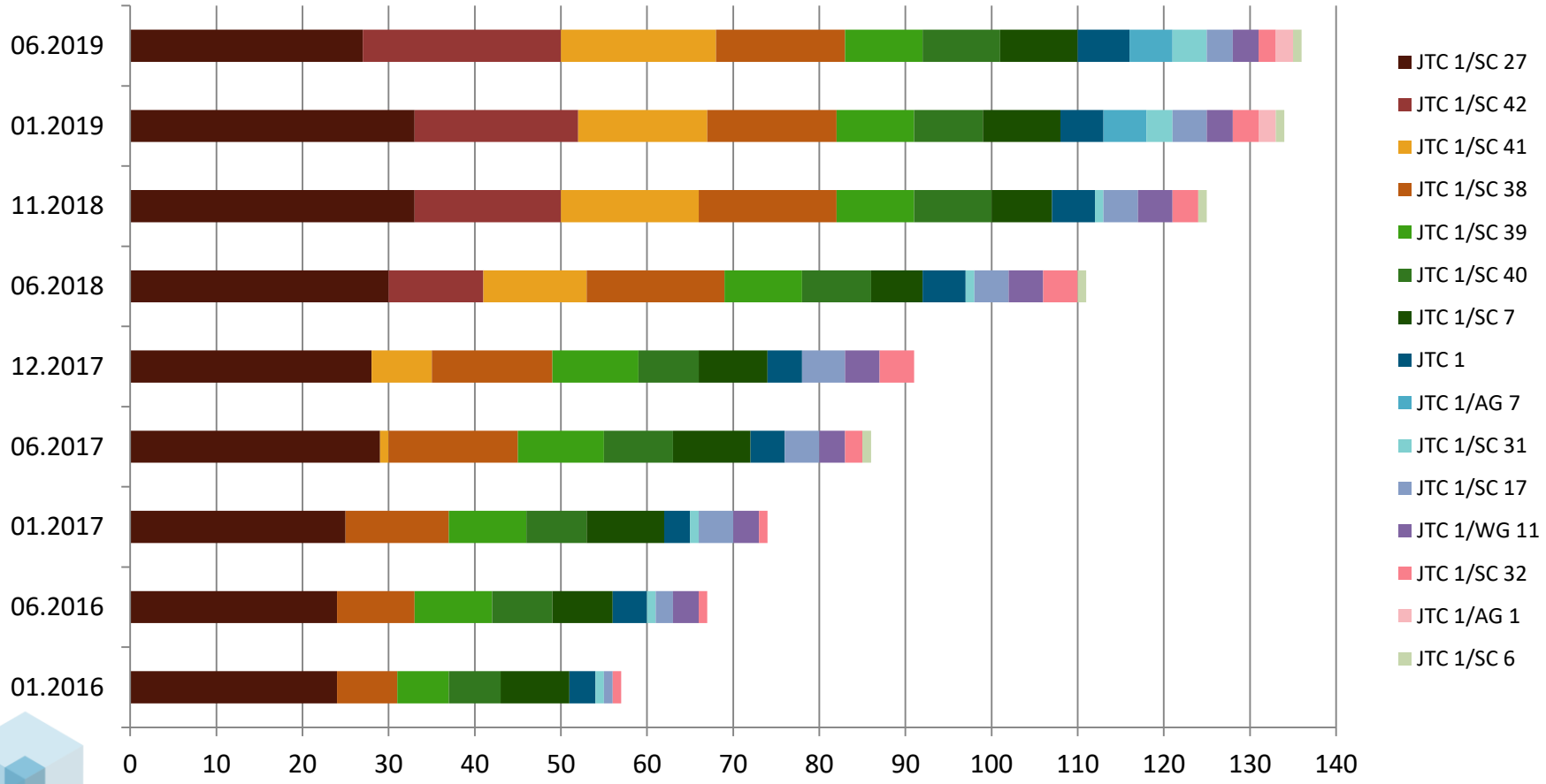
SMART SECURE ICT - AN ECOSYSTEM



SMART SECURE ICT - AN ECOSYSTEM

ISO/IEC JTC 1 NATIONAL PRESIDENCY - ILNAS

- **Top representation in JTC 1:**
  - 27 delegates in the IT security domain
  - 15 delegates in the Cloud Computing domain
  - 18 delegates in the IoT domain
  - 23 delegates in the Artificial Intelligence / Big Data domains



Registre national des délégués en normalisation - June 2019

ILNAS

Southlane Tower I · 1, avenue du Swing · L-4367 Belvaux

Tel. : (+352) 24 77 43 - 00 · Fax : (+352) 24 79 43 - 10

E-mail: info@ilnas.etat.lu

www.portail-qualite.lu