Welcome
Bienvenue
Willkommen

White Paper

DATA PROTECTION AND PRIVACY IN SMART ICT

SCIENTIFIC RESEARCH AND TECHNICAL STANDARDIZATION

12/10/2018
Luxembourg

ILNAS • ANEC

uni.lu
UNIVERSITÉ DU LUXEMBOURG

SnT
securityandtrust.lu

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

Technical standardization

Data protection and privacy in Smart ICT

- **Technical standardization** has the ability to provide technical or qualitative referential for products, services or processes
- Technical standards
    - Provide an effective tool for achieving various objectives
      (e.g., mutual understanding, costs reduction, eliminating waste, convenience of use etc.)
    - Developed on the fundamental principles stated by the WTO – transparency, openness, impartiality, consensus, effectiveness and relevance, coherence, to name a few
    - Play a role in innovation

Chapter FOUR

- Standardization committees/groups working on data protection and privacy aspects

    - ISO/IEC JTC 1/SC 27 – IT Security techniques

    - ISO/PC 317 – Consumer protection: privacy by design for consumer goods and services (created in 2018)

    - ITU-T SG 17 - Security

    - CEN/CLC JTC 13 – Cybersecurity and data protection

    - CEN/CLC JTC 8 – Privacy management in products and services

    - ETSI/TC CYBER – Cybersecurity

- **Structure** of the SC:
    - WG 1 – Information Security Management Systems (ISMS)
    - WG 2 – Cryptography and security mechanisms
    - WG 3 – Security evaluation testing and specification
    - WG 4 – Security controls and services
    - WG 5 – Identity management and privacy technologies

- ISO/IEC 27001:2013 – ISMS Requirements
- ISO/IEC 27002:2013 – Code of practice for information security controls

- The Secretariat as well as the Convenor of JTC 1/SC 27/WG 4 (Mr. Johann Amsenga) is a Luxembourg delegate

- Published standards (related to privacy and data protection)

  - ISO/IEC 29100 – Privacy framework

  - ISO/IEC 29101 – Privacy architecture framework

  - ISO/IEC 29134 – Guidelines for privacy impact assessment

  - ISO/IEC 29151 / ITU-T X.1058 – Code of practice for PII protection

  - ISO/IEC 29190 – Privacy capability assessment model

  - ISO/IEC 29146 – A framework for access management

  - ISO/IEC 29191 – Requirements for partially anonymous, partially unlinkable authentication

  - ISO/IEC 27018 – Code of practice for protection of PII in public Clouds acting as PII processors

- Relevant ETSI standards developed by TC CYBER

  - ETSI TS 103 532 – Attribute based encryption for attribute based access control

  - ETSI TS 103 458 – Application of attribute based encryption for PII and personal data protection on IoT devices, WLAN, Cloud and mobile services – High-level requirements

  - ETSI TR 103 304 – PII protection in mobile and Cloud services

  - ETSI TR 103 456 – Implementation of the Network and Information Security (NIS) Directive

  - ETSI TR 103 306 – Global cyber security ecosystem

- Basic data protection and privacy terms from different ISO standards (e.g., anonymity, PII, privacy controls, privacy-enhancing technology)

- Given that IoT is a combination of several technologies, standardization efforts could also be viewed as a culmination of diverse initiatives

- Automatic identification and data capture (AIDC) technologies
  - ISO/IEC JTC 1/SC 31 – AIDC techniques
  - CEN/TC 225 – AIDC technologies

- IoT related standardization
  - ISO/IEC JTC 1/SC 41 – Internet of Things and related technologies
  - ITU-T SG 20 – IoT and its applications including smart cities and communities

IoT aspect	Standardization Committee	Project		
		Identifier	Title	Current status
Foundations (vocabulary, architecture and frameworks)	ISO/IEC JTC 1/SC 41 WG 3	ISO/IEC 20924	Definitions and vocabulary	Under development
		ISO/IEC 30141	Reference architecture	Published
		PWI TR JTC1-SC41-1	Technical Report (TR) on IoT Edge Computing	Under development
		ISO/IEC 30147	Methodology for trustworthiness of IoT system/service	Under development
Interoperability, connectivity, conformance and testing	ISO/IEC JTC 1/SC 41 WG 4	ISO/IEC 21823-1	Interoperability for IoT Systems – Part 1: Framework	Under development
		ISO/IEC 21823-2	Interoperability for IoT Systems – Part 2: Transport interoperability	Under development
		ISO/IEC 21823-3	Interoperability for IoT Systems – Part 3: Semantic interoperability	Under development
Applications, platforms, use cases, middleware, tools and implementation guidance	ISO/IEC JTC 1/SC 41 WG 5	ISO/IEC TR 22417:2017	IoT use cases	Published

IoT aspect	Standardization Committee	Project		
		Identifier	Title	Current status
IoT Security	ITU-T SG 17	X.1361 (ex X.iotsec-2)	Security framework for IoT based on the gateway model	Under development
		X.secup-iot	Secure software update procedure for IoT devices	Under development
		X.nb-iot	Security requirements and frameworks for Narrow Band IoT	Under development
		X.ibc-iot	Security framework for use of identity-based cryptography in support of IoT services over Telecom networks	Under development
		X.ssp-iot	Security requirement and framework for IoT service platform	Under development
PII protection in IoT environments	ITU-T SG 17	X.iotsec-3	Technical framework of PII handling system in IoT environment	Under development
	ETSI CYBER	ETSI TS 103 458 v1.1.1 (06/2018)	Application of Attribute Based Encryption for PII and personal data protection on IoT devices, WLAN, Cloud and mobile services – High-level requirements	Published

- In 2014, ISO/IEC JTC 1/WG 9 Big data was established; later it was disbanded in 2018 with the creation of ISO/IEC JTC 1/SC 42 Artificial Intelligence

- JTC 1/SC 42 has one WG and three SGs
  - WG 1 – Foundational standards
  - SG 1 – Computational approaches and characteristics of AI systems
  - SG 2 – Trustworthiness
  - SG 3 – Use cases and applications

Big data aspect	Standardization Committee	Project		
		Identifier	**Title**	**Current status**
Vocabulary and definitions	ISO/IEC JTC 1/SC 42	ISO/IEC DIS 20546	Definition and vocabulary	Under development
		ISO/IEC AWI 22989	Artificial intelligence (AI) concepts and terminology	Under development
	ISO/TC 69/WG 12	ISO/NP 3534-5	Terms used in Big data (predictive analysis)	Under development
Reference architecture (ISO/IEC 20547 series)	ISO/IEC JTC 1/SC 42	ISO/IEC AWI TR 20547-1	Framework and application process	Under development
		ISO/IEC TR 20547-2	Use cases and derived requirements	Published
		ISO/IEC DIS 20547-3	Reference architecture	Under development
	ISO/IEC JTC 1/SC 27	ISO/IEC AWI 20547-4	Security and privacy	Under development
	ISO/IEC JTC 1/SC 42	ISO/IEC TR 20547-5	Standards roadmap	Published
Processing, including artificial intelligence	ISO/TC 69/WG 12	ISO 23347	Big data analytics – data science life cycle	Under development
		ISO/NP TR 23348	Big data analytics – Model validation	Under development
	ISO/IEC JTC 1/SC 42	ISO/IEC AWI 23053	Framework for AI systems using machine learning	Under development

12

Smart ICT standardization (Big data)

Big data aspect	Standardization Committee	Project		
		Identifier	Title	Current status
Data quality and metadata	ISO/IEC JTC 1/SC 7	ISO/IEC 25012:2008	Software product Quality Requirements and Evaluation (SQuaRE) – Data quality model	Published
Security and privacy	ISO/IEC JTC 1/SC 27	ISO/IEC AWI 20547-4 (repeated here for the sake of completeness)	Reference architecture –security and privacy	Under development

- ISO/IEC 27018 provides privacy controls in the context of Cloud computing
- ISO/IEC 29151 establishes the code of practice for PII protection that could be enhanced for Cloud computing users

- ISO/IEC JTC 1/SC 38 Cloud computing and distributed platforms
 - 13 published standards so far and 9 currently under development

Cloud computing aspect	Standardization committee	Project		
		Identifier	Title	Current status
Cloud data storage & processing	ISO/IEC JTC 1/SC 38	ISO/IEC 17826:2016	Cloud data management interface	Published
		ISO/IEC 19944:2017	Data and its flow across devices and Cloud services	Published
		ISO/IEC 19941:2017	Interoperability and portability	Published
Service Level Agreements (SLA)	ISO/IEC JTC 1/SC 38	ISO/IEC 19086-1:2016	Overview and concepts	Published
		ISO/IEC FDIS 19086-2	Metric model	Under development
		ISO/IEC 19086-3:2017	Core conformance requirements	Published
	ISO/IEC JTC 1/SC 27	ISO/IEC FDIS 19086-4	Components of security and of protection of PII	Under development
Security controls	ISO/IEC JTC 1/SC 27	ISO/IEC 29151:2017 ITU-T X.1631	Code for practice for information security controls based on ISO/IEC 27002 for Cloud services	Published
	ETSI CYBER	ETSI TS 103 532 V1.1.1 (03/2018)	Attribute Based Encryption for Attribute Based Access Control	Published

Cloud computing aspect	Standardization committee	Project		
		Identifier	Title	Current status
Personally Identifiable Information (PII) protection	ISO/IEC JTC 1/SC 27	ISO/IEC 27018:2014	Code of practice for protection of PII in public Clouds acting as PII processors	Published
	ETSI CYBER	ETSI TR 103 304 v1.1.1 (07/2016)	PII Protection in mobile and Cloud services	Published
		ETSI TS 103 458 v1.1.1 (06/2018)	Application of Attribute Based Encryption for PII and personal data protection on IoT devices, WLAN, Cloud and mobile services – High-level requirements	Published
Trust	ISO/IEC JTC 1/SC 3	ISO/IEC 23186	Framework of trust for processing multi-sourced data	Under development

Conclusions

- Security, privacy and data protection are becoming essential elements for building trust in ICT

- Identification of potential risks and development of innovative solutions to protect data and privacy in Smart ICT has attracted significant attention of the scientific community

- Development of technical standards in Smart ICT domains has become necessary

- Luxembourg is creating ecosystems to address challenges concerning security, privacy and data protection

Scientific developments

Technical standardization

Data protection & privacy (DPP)

Smart ICT

Chapter SIX
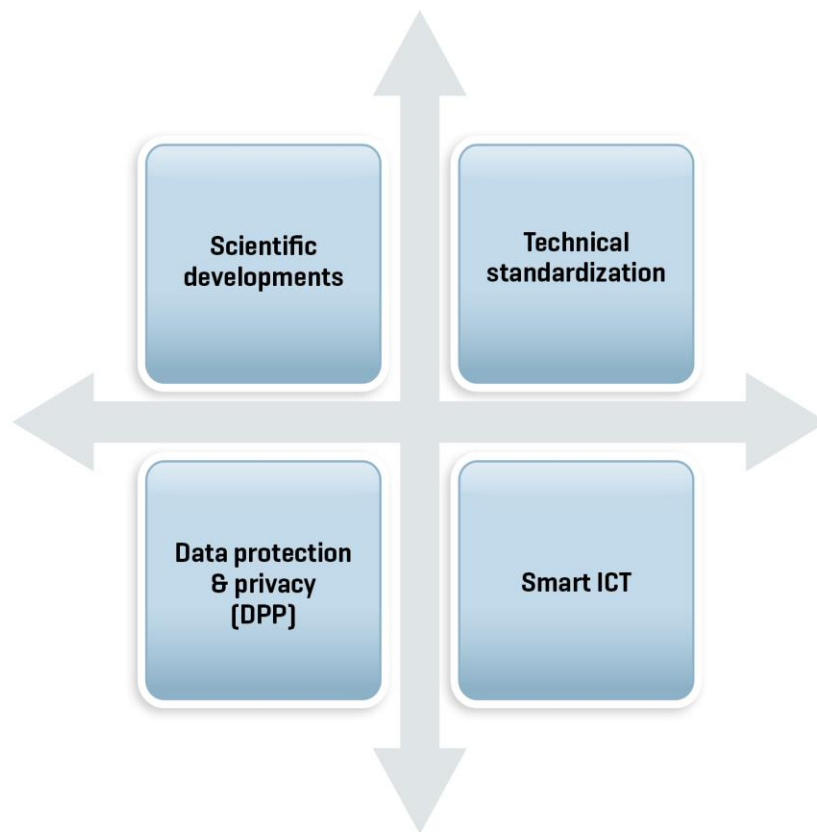
- University of Luxembourg and SnT are performing cutting-edge research to improve security, privacy and data protection capabilities of several emerging paradigms

- ILNAS – with the support of ANEC G.I.E. – is strengthening national ICT sector's participation in standardization work
    - Developing market interest and involvement
    - Promoting and reinforcing market participation
    - Supporting and building education about standardization and relevant research activities

- This white paper is available online

- Become a delegate!

Thank you
Merci
Danke

ILNAS · **ANEC**

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

Tel. : (+352) 24 77 43 - 70 · Fax : (+352) 24 79 43 - 70

E-mail : anec@ilnas.etat.lu

www.portail-qualite.lu