

ILNAS



Digital Trust in Internet of Things Breakfast

March 30, 2017

ILNAS / ANEC

PROGRAM

09h30	Introduction & Welcome words <i>Dr. Jean-Philippe HUMBERT, Deputy Director – ILNAS</i>
09h40	Presentation of the National Standards Body <i>Mr. Jérôme HOEROLD, Chief of the Standardization department - ILNAS</i>
09h50	White Paper presentation - Digital Trust for Smart ICT & Internet of Things <i>Dr. Johnatan PECERO SANCHEZ, Responsible of the Standardization department - ANEC GIE</i>
10h10	ICT Technical Standardization in Luxembourg <i>Mr. Nicolas DOMENJOUR, Project Officer “Standardization & ICT” - ANEC GIE</i>
10h20	Internet of Things Research & Standardization <i>Dr. Grégoire DANOY, Scientific Collaborator - University of Luxembourg</i> <i>Dr. Matthias BRUST, Research Associate - University of Luxembourg (SnT)</i>
10h40	Round Table Discussion <i>Moderator: Dr. Johnatan PECERO SANCHEZ</i>



Introduction

Dr. Jean-Philippe HUMBERT - ILNAS

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)
- ▶ **Status:** Public administration under the authority of the Minister of the Economy
- ▶ **Total staff:** 37 civil servants (March 2017)



Luxembourg's Standardization Strategy 2014-2020

PILLAR 1 Information and communication technologies (ICT)

- ▶ Support and constant **development of the standardization field dedicated to ICT**
- ▶ Implementation of the **Luxembourg's Policy on ICT standardization (2015-2020)**
 - Developing the interest and the involvement of the market
 - Promoting and reinforcing the participation of the market
 - Supporting and strengthening the education about standardization and related research activities
- ▶ Detection of **niche opportunities for economic developments**

PILLAR 2 National influence and compliance with legal attributions

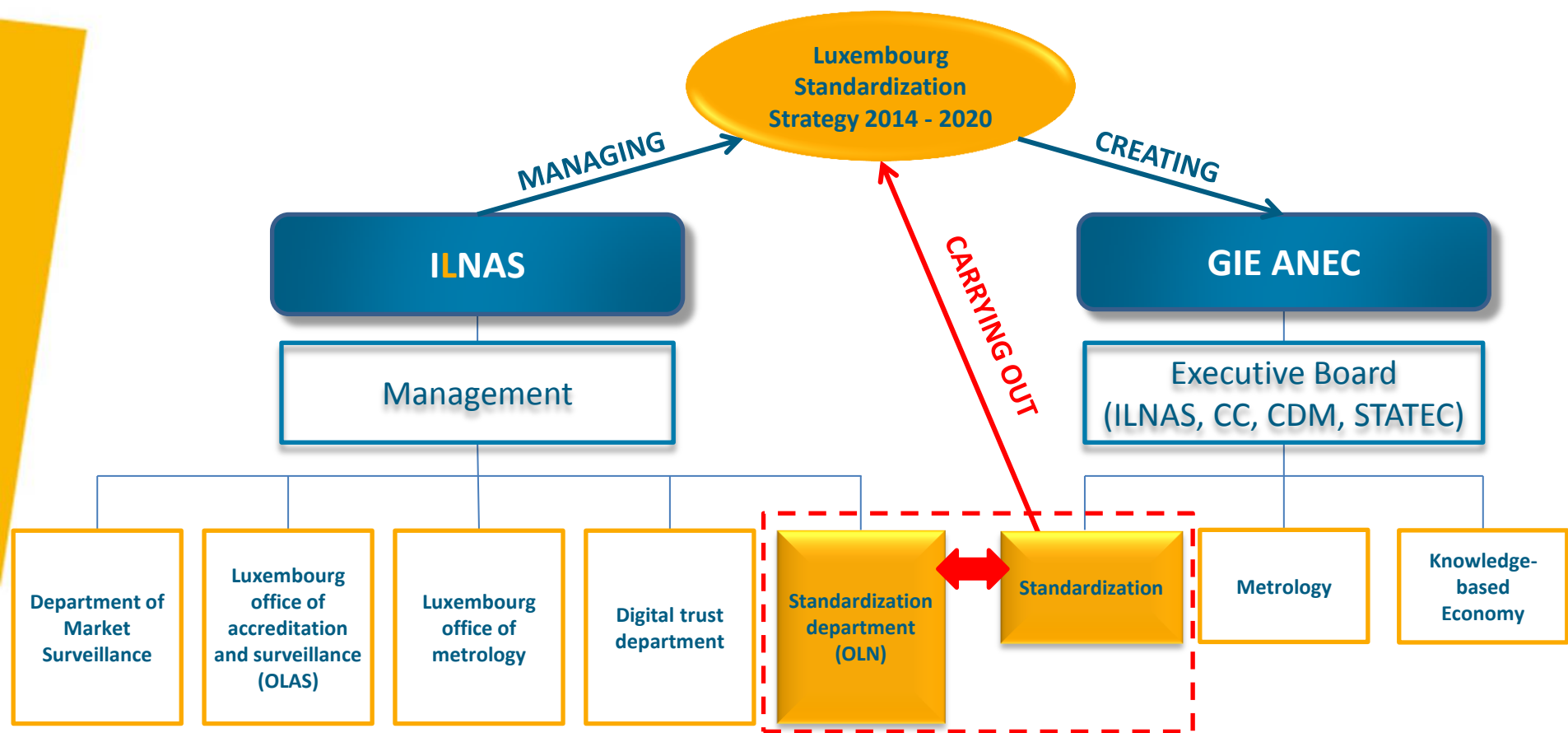
PILLAR 3 Products and services

ANEC, Agence pour la Normalisation et l'Économie de la Connaissance (Agency for Standardization and knowledge-based Economy)

- ▶ **Creation:** October 4, 2010
- ▶ **Status:** Economic Interest Grouping (EIG)
- ▶ **Object:**
 - Promotion, awareness raising and training, applied research in the field of standardization and metrology in order to support companies' competitiveness in Luxembourg
- ▶ **Total staff:** 11 employees (March 2017)
- ▶ **Partners:**



Position



MAIN ACTIVITIES – FIRST SEMESTER 2016



**White Paper
Green Computing**



**Training Catalog
2016**



**Moovijob Tour DeLux
2016**



IS Days 2016



**White Paper
Big Data V1.0**



ICT Spring 2016



**ANS TIC
V6.0**

JANUARY

FEBRUARY

MARCH

APRIL

MAY

JUNE

**Article White Paper
Green Computing
(Soluxions
Magazine)**



**Workshop
« Normalisation &
Green
Computing »**



**Article ITone.lu
(ISO/IEC JTC 1/SC 27
national Mirror
Committee)**



**After work
« Smart ICT »
Girls In Tech**



**Article
ITnation.lu
(White Paper
Big Data)**



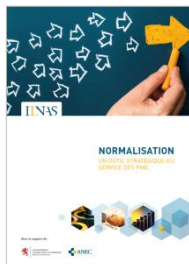
**Breakfast
White Paper
« Big Data »**



**Training in the
Technical High
School
Josy Barthel**



MAIN ACTIVITIES – SECOND SEMESTER 2016



Analysis of the University Certificate pilot project 2015/2016

New brochure "Standardization & SMEs"

White Paper "Digital Trust for Smart ICT"

Breakfast "Digital Trust for Smart ICT"

White Paper Big Data V1.2

JULY

AUGUST

SEPTEMBER

OCTOBER

NOVEMBER

DECEMBER



White Paper Big Data V1.1



Standards Analysis Aerospace sector-Luxembourg



Luxembourg Internet Days



Breakfast "Digital Trust for Big Data"

MAIN ACTIVITIES – FIRST SEMESTER 2017



Breakfast “Digital Trust in Cloud Computing”



Breakfast “Digital Trust in Internet of Things” (1st ed.)



SMART ANS TIC



ETSI WORKSHOP

JANUARY

FEBRUARY

MARCH

APRIL

MAY

JUNE

JULY

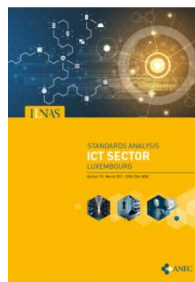
New version of the portail-qualite.lu



Conference APDL “Standardization & GDPR”



Publication of the ANS TIC V7.0



ILNAS positioning : Framework – Education about Standardization

FIRST STEP - University certificate “Smart ICT for Business Innovation” with University of Luxembourg

- Outcome of more than six years of work by ILNAS
 - ▶ Luxembourg Standardization Strategy 2014-2020
 - ▶ Policy on ICT technical standardization (2015-2020)
 - ▶ ILNAS: ETSI full member - Luxembourg Head of Delegation ISO/IEC JTC1
 - ▶ Pilot project conducted in the 2015-2016 academic year
 - ▶ **Next promotion:** January 2018

STRENGTHS

- Topics at the **cutting edge** and reflecting **current issues** in the field of ICT
- **No equivalent training in this area in Europe**
- An instrument to **strengthen the competitiveness** of national companies

OUTCOMES FOR THE NATIONAL ECONOMY

- Allow a **better understanding of the high level Smart ICT concepts**
- Definition of **new products** and/or **services**
- Identification of **niche markets**
- To improve **commercial approach**
- **Basis of new economic developments**
- Added value to **facilitate the communication with the client**



ILNAS positioning



- ▶ Strengthens its relation with academic partners in order to structure standards-related education and research in Luxembourg
 - Pilot project conducted between September 2015 and September 2016: University certificate “Smart ICT for Business Innovation” in partnership with the University of Luxembourg
 - Next promotion: January 2018 to January 2019
 - **Objective: Master degree related to technical standardization**
 - **Would address Smart ICT topics in line with national priorities, providing a smart way of linking technology, standards, and business and creating an additional means of innovation at national level**

White Paper “Digital Trust for Smart ICT” – 14th October 2016

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 stress 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

▶ <http://www.portail-qualite.public.lu/content/dam/qualite/fr/publications/confiance-numerique/etudes-nationales/white-paper-digital-trust-october-2016/White-Paper-Digital-Trust-October-2016.pdf>



White Paper DIGITAL TRUST FOR SMART ICT

Version 1.0 - October 2016



ILNAS logo and other small text at the bottom of the cover.

As a vital support sector for the media that become smarter through analytics, Internet of Things information security technology

In order to take the next steps to be clearly defined. Embracing knowledge, in continuous improvement, in this context, constitutes the greatest opportunity challenges.

This White Paper presents the challenges and prospects, and performing the related development standardization, which is highly examined with specific requirements, Internet of Things.

ILNAS, the national standardization strategy, with research initiatives, this White the necessary education about

Within this framework, Luxembourg will continue to consider technical standardization as a real force multiplier for the economy, competitiveness, and the ICT sector in particular.

Etienne Schneider
Deputy Prime Minister
Minister of the Economy

LONG-TERM RESEARCH ACTIVITIES AND OBJECTIVES

RESEARCH PROGRAM (2017-2020) ON DIGITAL TRUST FOR SMART ICT

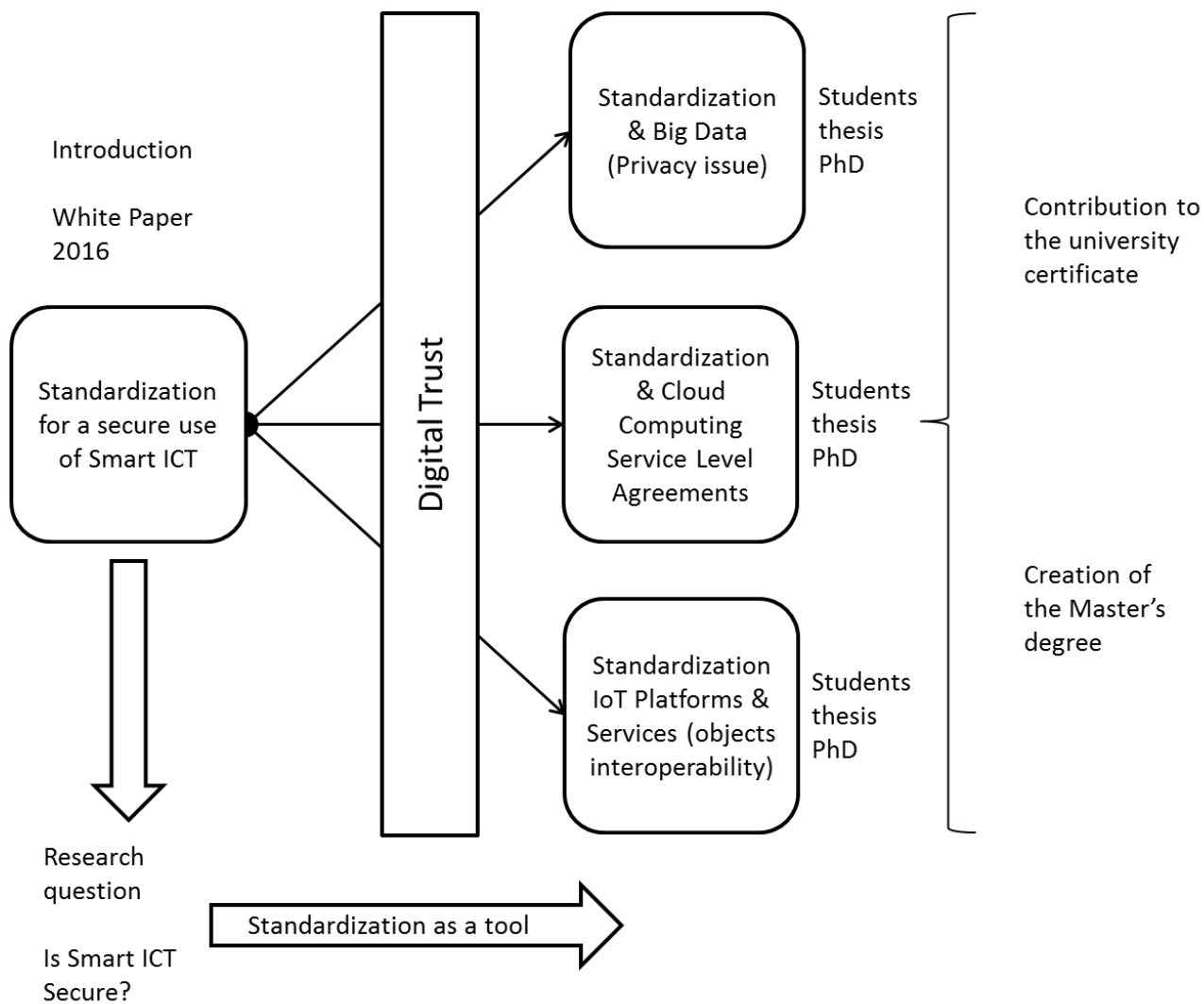
- Joint collaboration between ILNAS & SnT-UL to reinforce the collaboration in the domain of Smart ICT for Business Innovation through Technical Standardization
- **Partnership and contract between ILNAS and SnT has been signed in March 2017**
- Possibility to involve some students from the university certificate during their internship
- 3 PhD students will be involved : **Digital Trust for Smart ICT**
 - ▶ **Cloud Computing**
 - ▶ **Big Data and Analytics**
 - ▶ **Internet of Things**
- Other main targets of the research program
 - ▶ To support the evolution of the academic program through the results of the research
 - ▶ **To serve as a basis for a future Master Program Smart Secure ICT for Business Innovation (expected 2019)**

ILNAS

SnT

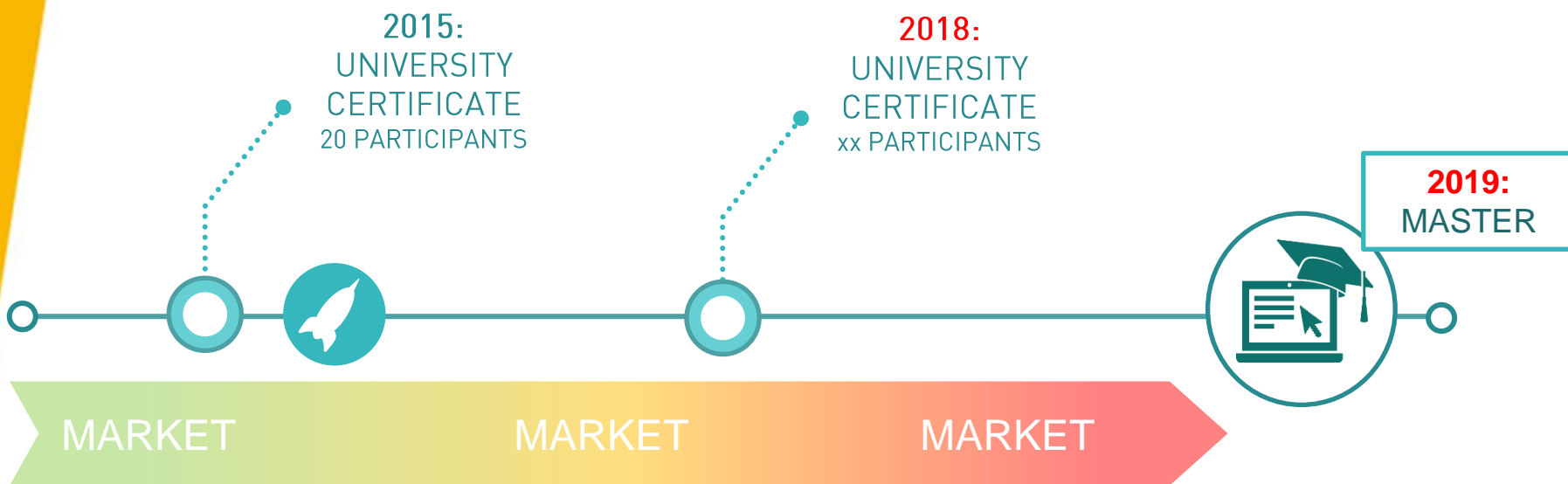
securityandtrust.lu

LONG-TERM RESEARCH ACTIVITIES AND OBJECTIVES



UNIVERSITY CERTIFICATE SMART ICT FOR BUSINESS INNOVATION MID AND LONG-TERM OBJECTIVES

Prospective evolution





Presentation of the National Standards Body

Mr. Jérôme HOEROLD - ILNAS

ILNAS Standardization activities in Luxembourg

▶ **Creation of national standards**

- National Annexes of the Eurocodes
- National Annex concerning the Winter Diesel
- National standard about the living surface
- Creation of a national standards office in the field of construction

▶ **Create a normative culture in Luxembourg**

- University Certificate "Smart ICT for Business Innovation" at the University of Luxembourg
- Promotion in the field of standardization (Newsletter, portail-qualite.lu, LinkedIn, events, ...)
- Trainings and research in the field of standardization
- Awareness raising sessions in high schools
- Communication plan for SMEs

I - Availability of standards

Standardization catalogue

- 62 national standards

- 56.996 European Standards from CEN, CENELEC and ETSI

- 58.812 International Standards from ISO and IEC

- 45.514 DIN standards

- ▶ More than **160.000 normative documents** at your disposal

ILNAS

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



I - Availability of standards ILNAS e-shop

- ▶ Format: electronic
- ▶ Language: French, German and English
- ▶ Competitive prices
- ▶ Free access to documents in public enquiry




The screenshot shows the ILNAS e-shop homepage. At the top, there is a navigation bar with the ILNAS @SHOP logo and flags for French, German, and English. Below the navigation bar, a welcome message reads "WELCOME TO THE ILNAS E-SHOP!". A main content area contains a search bar, a list of search criteria (Ratified, Draft, Withdrawn, Public enquiry), and an advanced search section with tabs for "How to search standards?", "How to purchase standards?", and "How to get your standards?". A sidebar on the right includes sections for "Login", "Catalogues", "Help", "Satisfaction enquiry", "Newsletter", and "Free of charge lifelong learning 'Standardization'". At the bottom, there is a "News" section with a featured article about "Cloud Computing" and a "PORTAIL-QUALITE.LU" logo.



II - Participation in standardization

Different possibilities

- ▶ **How to participate in the development of national, European and international standards ?**
 1. Comment of draft standards in public enquiry
 2. Active participation in a technical committee



II - Participation in standardization

1. Public enquiry

- ▶ Navigate in the ILNAS e-shop in order to comment a draft standard which is in the stage of public enquiry



- ▶ <https://ilnas.services-publics.lu>



The screenshot shows the ILNAS eSHOP website. At the top, there is a navigation bar with the ILNAS eSHOP logo and flags for France, Germany, and the UK. Below the navigation bar, a welcome message reads "WELCOME TO THE ILNAS E-SHOP!". A main section titled "National (ILNAS, DIN), European (EN) and International (ISO, IEC) standards are available here!" provides information about the standards available. A search bar is prominently displayed, with filters for "Ratified standards", "Draft standards", "Withdrawn standards", and "Standards in public enquiry". Below the search bar, there is a section for "Advanced search" with tabs for "How to search standards?", "How to purchase standards?", and "How to get your standards?". The "How to search standards?" tab is active, showing two ways to search: a quick search box and an advanced search with criteria like standard reference, technical committee, domain, and edition date. On the right side, there are several utility boxes: "Login" with a "Login/Register" button, "Catalogues" with links to browse by domain, committee, or EC Directive, "Help" with links to general terms, shopping guide, and contact, "Satisfaction enquiry" with a "Share your opinion" button, "Newsletter" with a "Register for our newsletter" button, and "Free of charge lifelong learning 'Standardization'" with links to proposed training, forthcoming sessions, and registration. At the bottom, there is a "News" section with a headline "Cloud Computing : renforcer la confiance grâce aux normes" and a small image of a cloud computing network.

WELCOME TO THE ILNAS E-SHOP!

National (ILNAS, DIN), European (EN) and International (ISO, IEC) standards are available here!

ILNAS offers you the possibility to search and purchase National, European and International Standards, prepared and adopted by the Standardization Organizations such as ILNAS, DIN, CEN, CENELEC, ETSI, ISO and IEC. This online catalogue includes draft standards, adopted and published ones as well as historical deliverables.

A read-only access to standards is offered [for free at several locations](#) in Luxembourg.

Search a standard

- Ratified standards
 Draft standards
 Withdrawn standards
 Standards in public enquiry

Advanced search

-

Two ways are provided to you :

- A quick Search box allowing you to search by standard code (number) or keywords and phrases
- An Advanced Search which allows you to combine further search criteria such as :
 - Standard reference / wording
 - Standardization Body
 - Technical Committee
 - Domain (ICS Field: International Classification for Standards)
 - Directive
 - Edition date

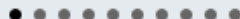
News

Cloud Computing : renforcer la confiance grâce aux normes

En 2016, 19 % des entreprises luxembourgeoises utilisaient des services de Cloud Computing[1], soit une progression de 6 % depuis 2014. Cette technologie offre de nombreux avantages aux organisations qui l'adoptent (ex. : accessibilité, optimisation des coûts) cependant plusieurs facteurs, tels que les potentiels problèmes de sécurité ou de portabilité, limitent encore son usage. Dans ce cadre, les organisations internationales de normalisation travaillent activement à développer des normes répondant à ces problématiques afin de favoriser l'adoption du Cloud Computing par les organisations.



[Lire la suite](#)



Login

- [Login/Register](#)

Catalogues

- Browse by [Domain \(ICS Code\)](#)
- Browse by [Committee](#)
- Browse by [EC-Directive](#)

Help

- ["ILNAS e-Shop" General Terms and Conditions of Sale](#)
- [Shopping guide](#)
- [Contact](#)

Satisfaction enquiry

- [Share your opinion](#)

Newsletter

- [Register for our newsletter](#)

Free of charge lifelong learning "Standardization"

- [Proposed training program](#)
- [Forthcoming sessions](#)
- [Registration](#)



PORTAIL-QUALITE.LU
QUALITE - SECURITE - CONFORMITE

SEARCH RESULTS

SORTED BY		RESULTS PER PAGE 10		RESULT(S) 1 - OF 573		1 2 3 4 5 ... 58	
	FREE PREVIEW	PRICE	LANGUAGE				
<p>FprEN 16798-3 Edition 07/2017 </p> <p>Energy performance of buildings - Part 3: Ventilation for non-residential buildings - Modules M5-1, M5-4 - Performance requirements for ventilation and room-conditioning systems</p> <p>TC/SC : CEN/TC 156</p> <p>Status : Final draft - Active</p>	<p>FR </p> <p>EN </p> <p>DE </p>	<p>€ 0.00</p> <p>You can comment on this draft standard</p>	<p>FR </p> <p>EN </p> <p>DE </p>	<p></p>			
<p>FprEN 1359 Edition 07/2017 </p> <p>Gas meters - Diaphragm gas meters</p> <p>TC/SC : CEN/TC 237</p> <p>Status : Final draft - Active</p> <p><i>At present no electronic version for this standard online for following language version(s): FR. Please feel free to contact normalisation@ilnas.etat.lu</i></p>	<p>EN </p> <p>DE </p>	<p>€ 0.00</p> <p>You can comment on this draft standard</p>	<p>EN </p> <p>DE </p>	<p></p>			
<p>FprEN 14187-1 Edition 06/2017 </p> <p>Cold applied joint sealants - Test methods - Part 1: Determination of rate of cure</p> <p>TC/SC : CEN/TC 227</p> <p>Status : Final draft - Active</p>	<p>FR </p> <p>EN </p> <p>DE </p>	<p>€ 0.00</p> <p>You can comment on this draft standard</p>	<p>FR </p> <p>EN </p> <p>DE </p>	<p></p>			
<p>prEN 62046:2017 Edition 02/2016 </p> <p>Safety of machinery - Application of protective equipment to detect the presence of persons</p> <p>TC/SC : CLC/TC 44X</p> <p>Status : Final draft - Active</p> <p><i>At present no electronic version for this standard online. Please feel free to contact normalisation@ilnas.etat.lu</i></p>		<p>€ 0.00</p> <p>You can comment on this draft standard</p>					
<p>FprEN 10028-3 Edition 07/2017 </p> <p>Flat products made of steels for pressure purposes - Part 3: Weldable fine grain steels, normalized</p> <p>TC/SC : EQUIS/TC 107</p> <p>Status : Final draft - Active</p>	<p>FR </p> <p>EN </p> <p>DE </p>	<p>€ 0.00</p> <p>You can comment on this draft standard</p>	<p>FR </p> <p>EN </p> <p>DE </p>	<p></p>			



Login

- [Login/Register](#)

Search a standard

R ratified standards
 Draft standards
 Withdrawn standards

Standards in public enquiry

[Advanced search](#)

Help

- ["ILNAS e-Shop" General Terms and Conditions of Sale](#)
- [Shopping guide](#)
- [Contact](#)

Satisfaction enquiry

- [Share your opinion](#)

Newsletter

- [Register for our newsletter](#)

Free of charge lifelong learning "Standardization"

- [Proposed training program](#)
- [Forthcoming sessions](#)
- [Registration](#)

II - Participation in standardization

2. National delegate in standardization

▶ **Who can participate ?**

- Every socio-economic actor with a certain expertise

▶ **Cost of participation ?**

- Free participation in Luxembourg

▶ **National experts register (March 2017)**


- 241 persons registered
- 651 registrations in technical committees

Registre national des délégués en normalisation - Mars 2017

Nombre d'inscriptions aux comités techniques :

ILNAS/OLN	24
CEN	192
CENELEC	16
CEN/CENELEC	2
CEN/CENELEC/ETSI	2
ECISS	21
ISO/IEC	158
ISO	227
IEC	9
Total	651

Nombre de personnes inscrites : 241



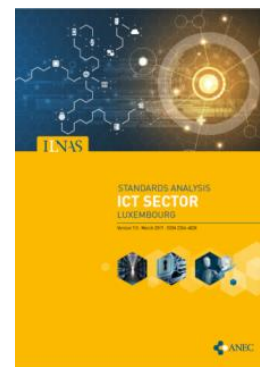
1, av du Swing - L-4367 Belvaux - Tél. : (+352) 24 77 43 40 - Fax : (+352) 24 79 43 40 - Email : normalisation@ilnas.etat.lu - www.portail-qualite.lu

mercredi 29 mars 2017 Approuvée par Jérôme HOEROLD Page 1 sur 67

Products and services

- ▶ ILNAS, in collaboration with ANEC EIG, offers the following products and services to the national market :
 - Diffusion of normative information
 - Training and awareness sessions
 - Standards watch
 - Standards analysis (ICT)

- ▶ These products and services are provided for free on simple demand



Stay informed about ILNAS activities

Portail qualité:
www.portail-qualite.lu

ILNAS e-shop:
<https://ilnas.services-publics.lu/>

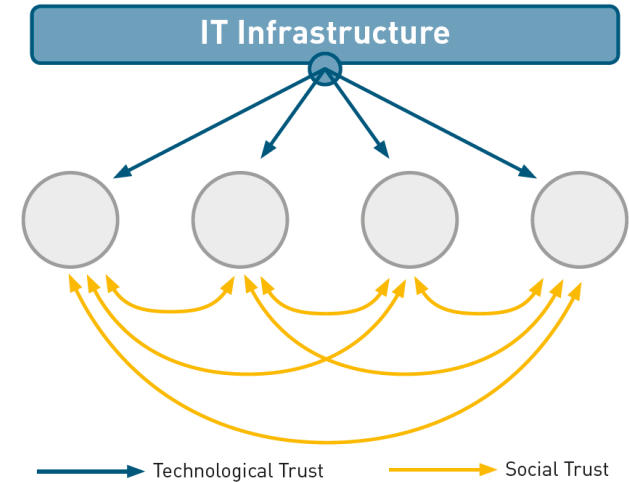


White Paper ***Digital Trust for Smart ICT - Internet of Things (IoT)***

Dr. Johnatan PECERO - ANEC GIE

Trust Introduction

- ▶ Fundamental elements of trust
 - **Expectancy**
 - trustor anticipates a specific behavior from the trustee;
 - **Belief**
 - trustor has confidence that the expected behavior occurs
 - based on the evidence of the trustee's competence, goodwill, and integrity;
 - **Risk willingness**
 - trustor is prepared to take a risk for that belief.
 - trustee behavior is beyond the control of the trustor.
- ▶ **Expectancy, belief, and risk willingness** are both *social* and *technological* trust components at the same time.





White Paper
**DIGITAL TRUST
FOR SMART ICT**
Version 3.0, October 2016



1

SMART ICT, A DEFINITION AND INTRODUCTION
TO THE CONCEPTS

2

DIGITAL TRUST FOR SMART ICT: ECONOMIC
CHALLENGES AND PROSPECTS

3

DIGITAL TRUST FOR SMART ICT: TECHNICAL
APPROACHES

4

STANDARDIZATION TO LEVERAGE DIGITAL
TRUST

5

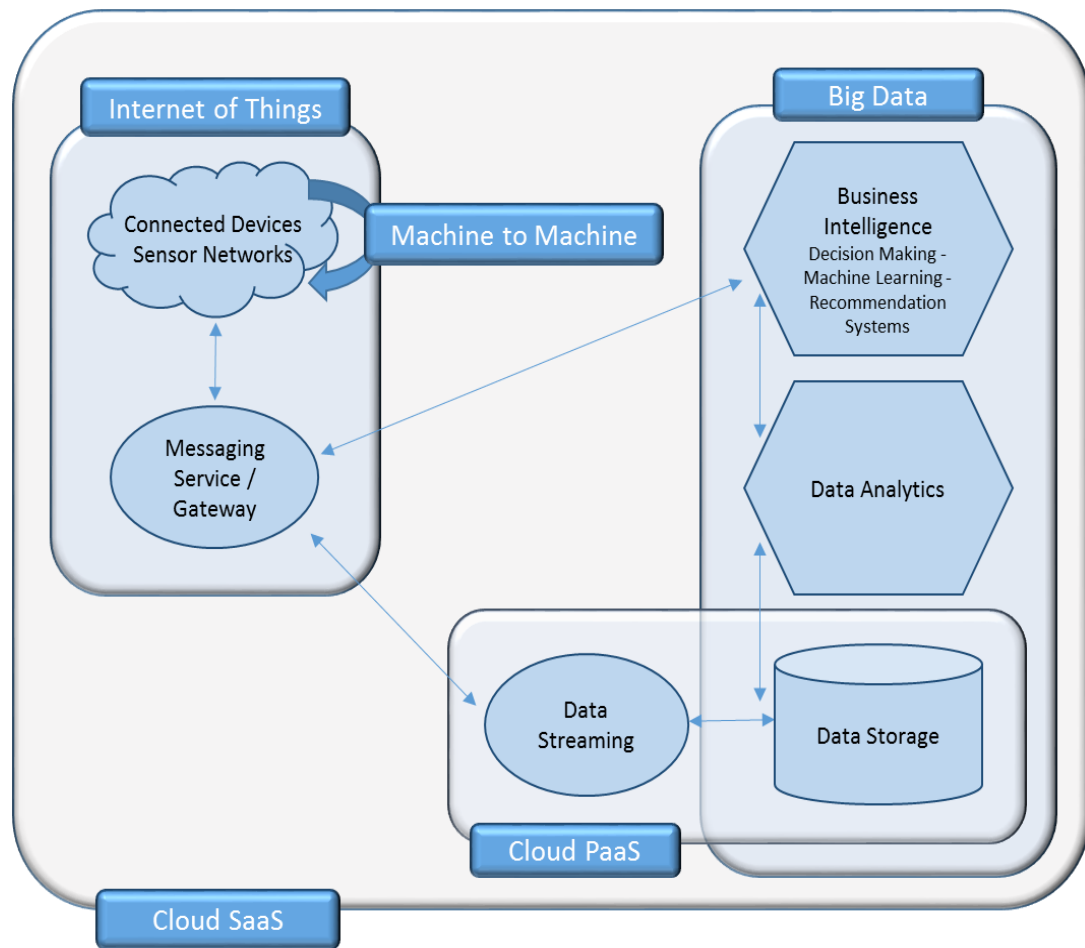
CONCLUSIONS AND OUTLOOK

Introduce each of the 3 smart technologies, place them into context, provide technology characteristics and introduce Digital Trust requirements

- Smart Technology Landscape
- **Internet of Things (IoT)**
- Cloud Computing
- Big Data & Analytics
- Leads for Leveraging Digital Trust

Overview

- ▶ Smart ICT
 - Internet of Things
 - Cloud Computing
 - Big Data & Analytics



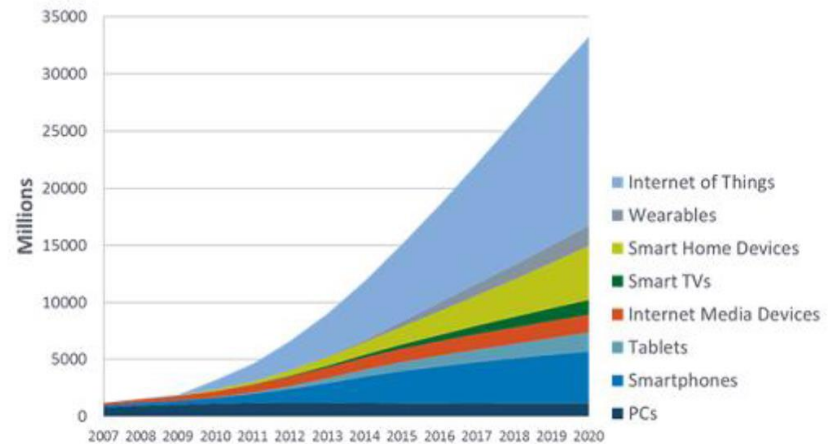
Today: exponential traffic increase of Internet

- Annual global IP traffic passes **zettabyte threshold** and will reach 2 zettabytes per year by 2019;
- **Global Internet traffic** in 2019 will be equivalent to 66 times the volume of the entire Internet in 2005;
- Two-thirds of **IP traffic** will originate with non-PC devices by 2019;
- The number of devices connected to **IP networks** will be more than three times the global population by 2019;

(b) Gartner, Inc: projects that by 2020 each person is expected to have on average of 4 connected devices.

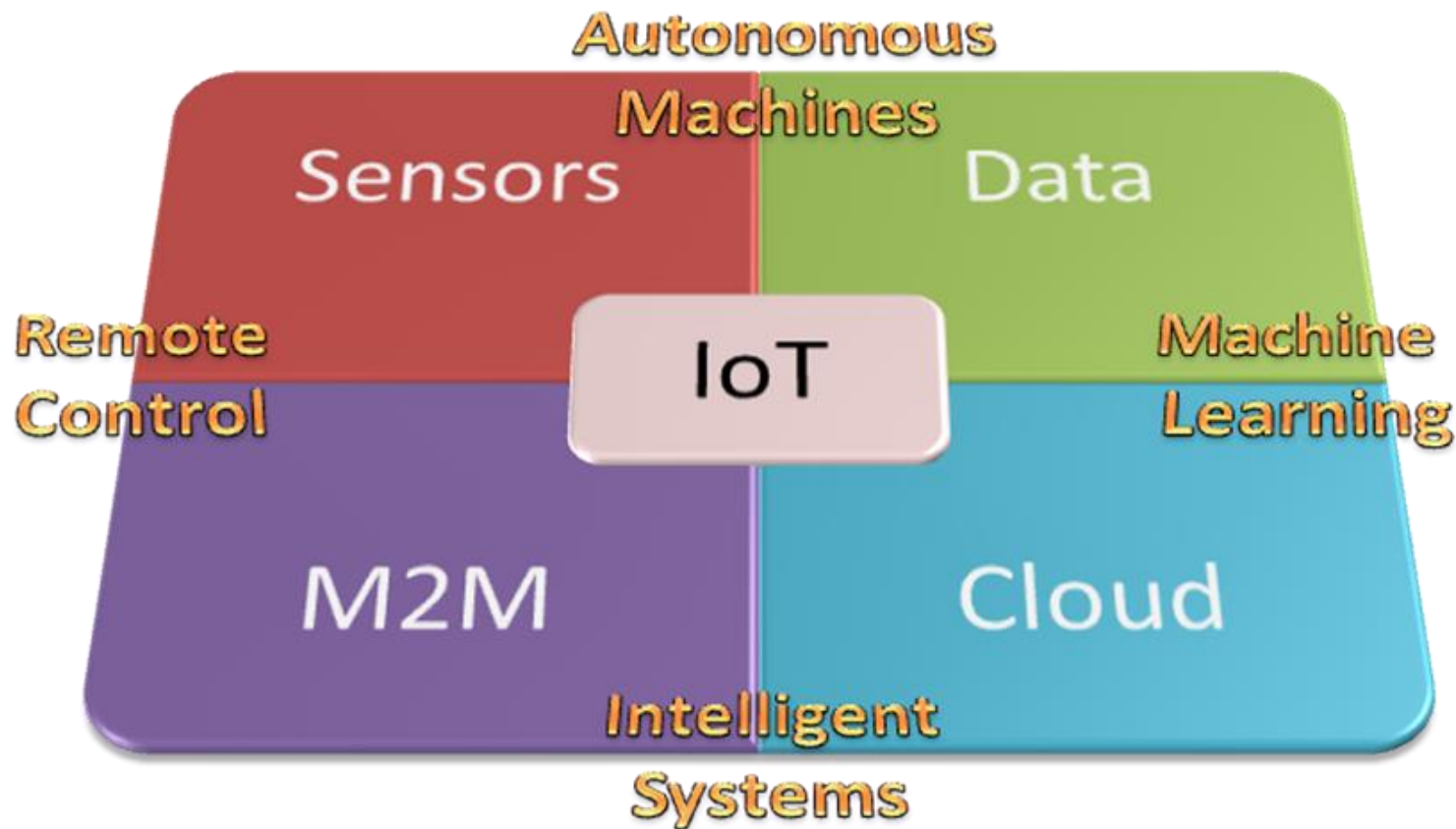
(a) Gartner, Inc: forecasts that 8.4 billion connected things will be in use worldwide in 2017 and 33 billion Internet devices by 2020.

- 33 Billion Internet Devices By 2020: Four Connected Devices For Every Person In World.



Source: Strategy Analytics, October 2014

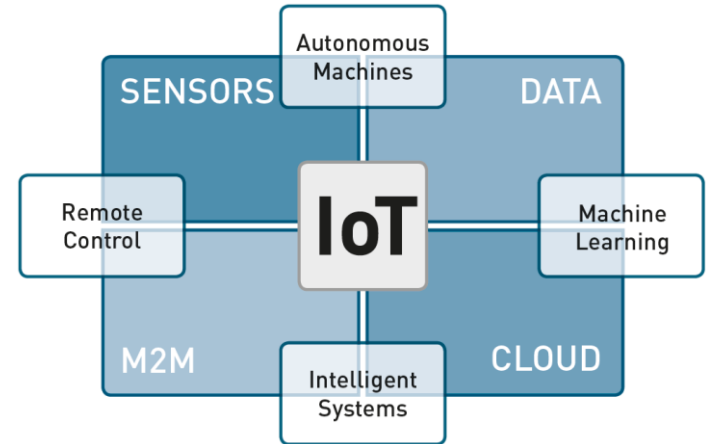
The evolution of IoT is supported by four technological developments.



Main enablers of the Internet of Things (OECD, 2015)

IoT

- ▶ Some characteristics
 - Permanently connected
 - Processing data
 - Interacting with humans
 - Communicating with each others
- ▶ Some Digital Trust challenges
 - Authentication
 - Authorization
 - Data confidentiality
 - Privacy & security
- ▶ Problem
 - Typical measures inadequate due to low processing power of some devices



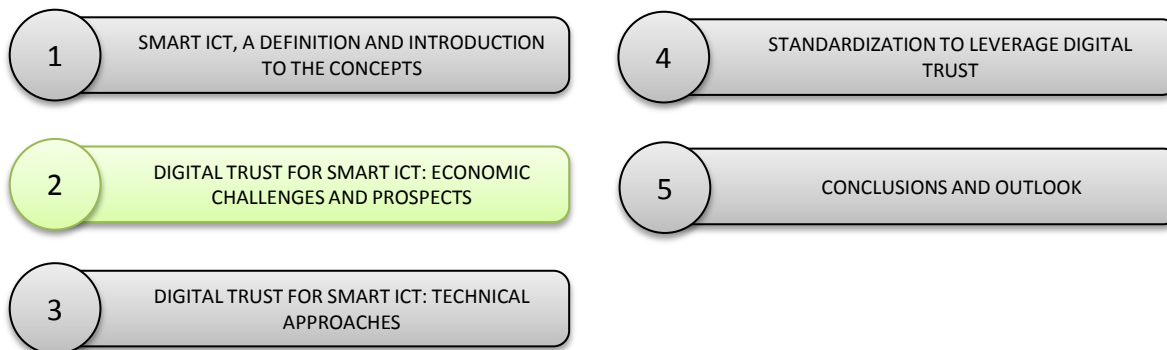
*IoT security will evolve fast in next years, however the **skills shortage** today will only accelerate*



White Paper
**DIGITAL TRUST
 FOR SMART ICT**
 Version 3.0, October 2016



ILNAS



- **Economic Analysis and Prospects**
 - IoT
 - Cloud Computing
 - Big Data & Analytics
- **Economic Challenges of Trust**
 - IoT
 - Cloud Computing
 - Big Data & Analytics

IoT smart applications

- ▶ Remote patient monitoring;
- ▶ Energy consumption control;
- ▶ Traffic control;
- ▶ Smart parking systems;
- ▶ Inventory management;
- ▶ Production chain;
- ▶ Customization of supermarket shopping;
- ▶ Civil protection;

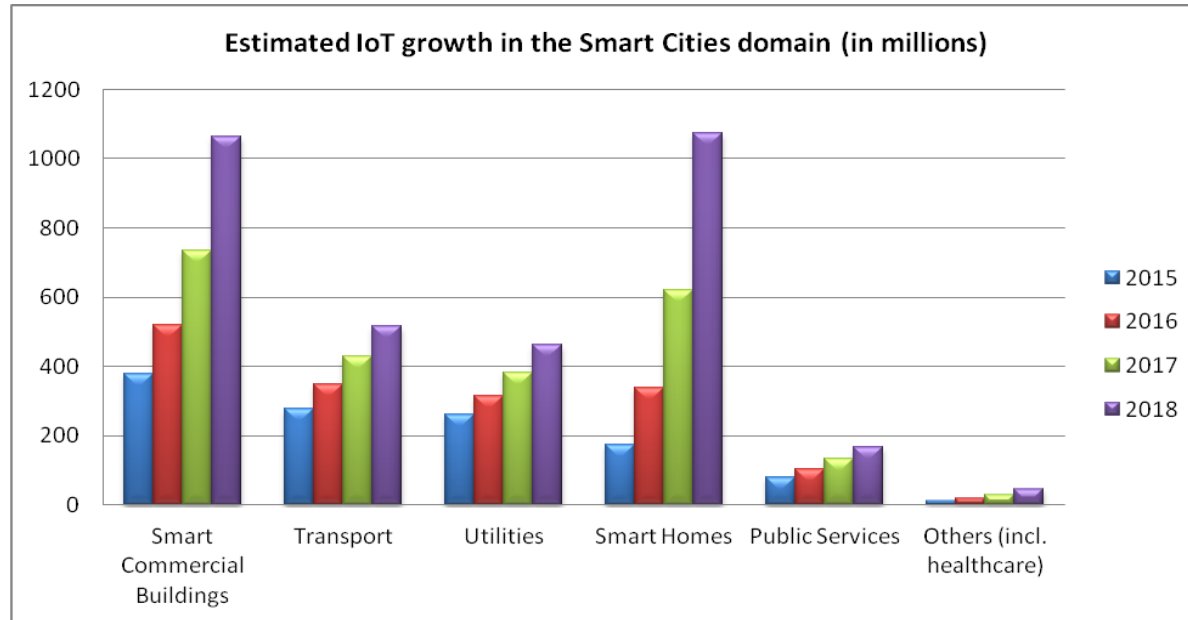
Smart Society

And the emergence of an outcome economy: fuelled by software-driven services; innovations in hardware, etc

Collaboration between humans and machines

Developments in IoT applications

- ▶ Smart City Domain
- ▶ Industrial Domain
- ▶ Healthcare and Well-being Domain



Smart City Domain – 5 categories

- ▶ **Smart commercial buildings**- make occupants productive at the lower cost and environmental impact (e.g. air quality, illumination);
- ▶ **Transport** – IoT-based systems to manage traffic flow;
- ▶ **Utilities** – smart resource management;
- ▶ **Smart homes** - enable occupants to control or program automated home electronic devices and services anywhere, anytime;
- ▶ **Public services** - safety and health in the public domain;

Industrial Domain

- ▶ Smart Manufacturing
 - more flexible and resource efficient;
 - fully optimized in the use of direct material inputs as well as use of energy and water.
- ▶ Smart Logistics
 - Make transport more efficient and effective for both manufacturers, logistic service providers and retailers.
- ▶ Smart Agriculture
 - Makes food production more efficient by saving energy and water, using fewer resources and reducing waste.

Healthcare and Well-being Domain

- ▶ Products and services in the domain of healthcare and well-being
 - E.g. remote health monitoring of chronically ill people or improve people's social engagement, respectively;
- ▶ In the well-being domain IoT may also provide benefits for improving the quality of life of people
 - E.g. devices connected with apps running on smartphones providing lifestyle improvement suggestions

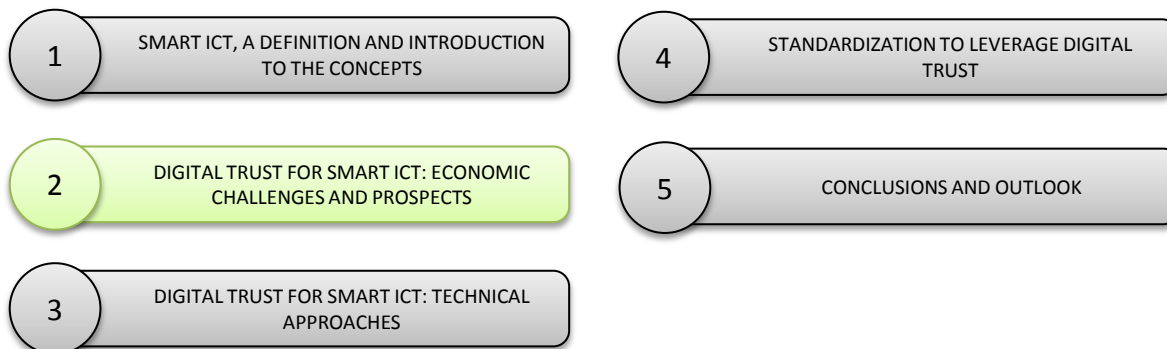
Cisco estimates that there will be 578 million wearable devices globally growing up 40% more than in 2014



White Paper
**DIGITAL TRUST
 FOR SMART ICT**
 Version 3.0, October 2016



ILNAS
 INSTITUT FÜR INFORMATIONELLE
 NETZWERKE



- Economic Analysis and Prospects
 - IoT
 - Cloud Computing
 - Big Data & Analytics
- **Economic Challenges of Trust**
 - **IoT**
 - Cloud Computing
 - Big Data & Analytics

Gaining customers' Digital Trust

- ▶ Imperative to focus on how personal data is used for IoT:
 - Use ***anonymised*** data when practical.
 - Respect the ***context*** in which personally identifiable information is collected.
 - Be ***transparent*** about data use.
 - Automate ***accountability*** mechanisms.
 - Develop ***Codes of Conduct***.
 - Provide individuals with reasonable ***access to*** personally identifiable information.

Personal health information has to be protected and addressing privacy concerns appropriately is crucial in such applications. It will involve informed consent, data encryption and other data security mechanisms.

Security requirements and Digital Trust in IoT

Not meeting IoT security requirements may result in physical harm:

- Intercepting of data
 - could reveal information about infrastructure operations, e.g. commands to start/stop engines;
- Injecting fake data
 - could result in disruption processes, or could be used to mask physical attacks;
- Incorrect commands
 - could be used to trigger unplanned events or send physical resources to dangerous areas.

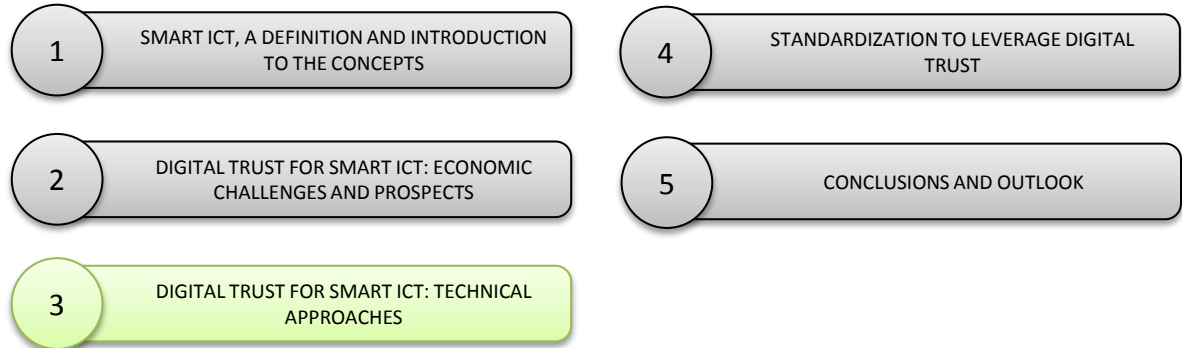
Wearable Smart Devices : « Always in-contact with the body »



White Paper
**DIGITAL TRUST
FOR SMART ICT**
Version 3.0, October 2016



ILNAS | ANEC



- **Trust in Smart ICT**

- Privacy
- Data and Information Security
- Interoperability

- **Trust in Cloud Computing**

- Trust as a Human Concern
- Trust Models
- Trust as a Technical Challenge
- Trust as a Legal Puzzle

- **Trust in Big Data**

- Data Accessibility

- Data Provenance and Reproducibility
- Privacy Concerns in Big Data
- Information and Data Security
- Access and Policy Management Techniques

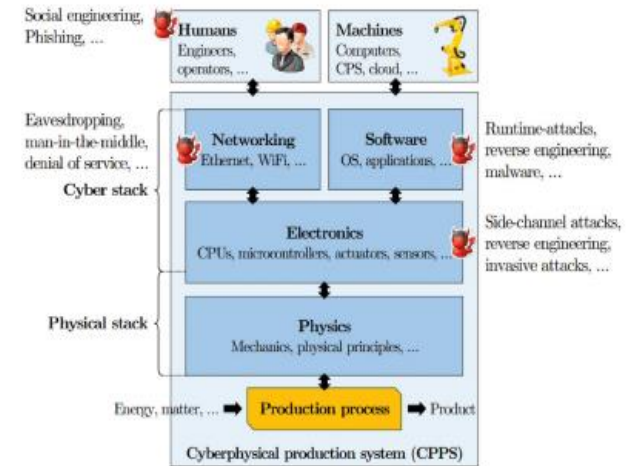
- **Trust in Internet of Things**

- Privacy, Anonymity and Consent
- Attack Surfaces and Threats
- Smart Home Security
- Security in Embedded Devices and Real-Time Processing
- Transmission Encryption and Security
- Security in IoT Friendly Messaging Protocols
- Authentication / Secure Pairing

Digital Trust in IoT

- ▶ Privacy, Anonymity and Consent
 - Legal data protection frameworks must be amended [48]
 - Data caps
 - Notice and choice
 - **Privacy by design**
 - Accountability
 - IoT Ecosystem

- ▶ Attack surfaces and threats & Smart home security
- ▶ Security in embedded devices and real-time processing
- ▶ Transmission encryption and security
- ▶ Security in IoT friendly messaging protocols
- ▶ Authentication/secure pairing



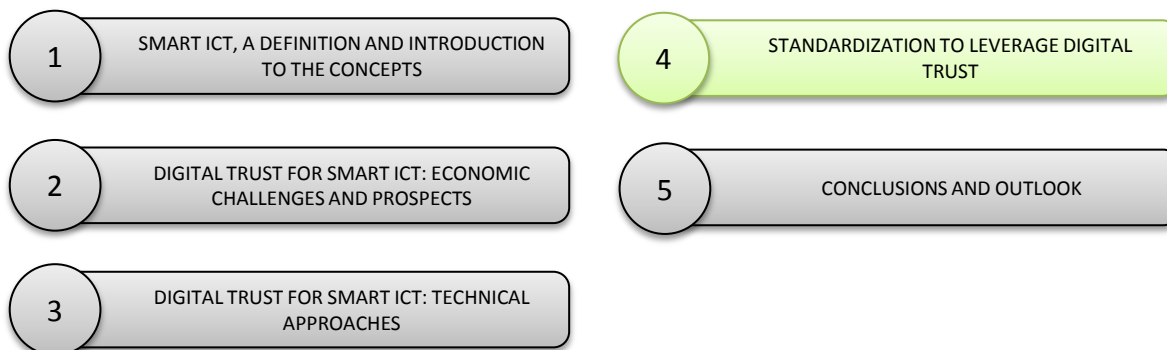
[48] V. A. Almeida, D. Doneda, and M. Monteiro, "Governance Challenges for the Internet of Things," *IEEE Internet Comput.*, vol. 4, pp. 56–59, 2015..



White Paper
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ILNAS



- **Cloud Computing Standardization Technical Committees & Standards**
 - ISO & ISO/IEC
 - ETSI
 - ITU-T
- **Big Data Standardization Technical Committees & Standards**
 - ISO & ISO/IEC
 - ITU-T Study Group 13
 - NIST Public Working Group for Big Data
- **IoT Standardization Technical Committees & Standards**
 - ISO & ISO/IEC
 - ETSI
 - oneM2M
- **Common Standardization Technical Committees & Standards**
 - ITU-T
 - NIST Cyber-Physical Systems Public Working Group
 - The Alliance for IoT
 - Open Connectivity Foundation
 - IoT-A's reference model
 - ISO/IEC JTC 1/SC 27 – IT Security techniques
 - ISO/IEC JTC 1/SC 32 – Data management and interchange
 - ISO/IEC JTC 1/SC 40 – IT Service Management and IT Governance
 - ETSI/TC CYBER – Cyber Security
 - ETSI/ISG ISI – Information Security Indicators
 - CEN-CENELEC technical committees

Standards and technical standardization

- ▶ Standards and technical standardization can help establish and maintain Digital Trust in relation to current and future Smart ICT technologies

IoT at ISO/IEC JTC 1

1. ISO/IEC JTC 1/WG 10 – Internet of Things
2. ISO/IEC JTC 1/WG 7 – Sensor Networks
3. New developments in ISO/IEC JTC 1 : Establishment of JTC 1 **Subcommittee SC 41, Internet of Things and related technologies** (more information into the related technical standardization presentation)

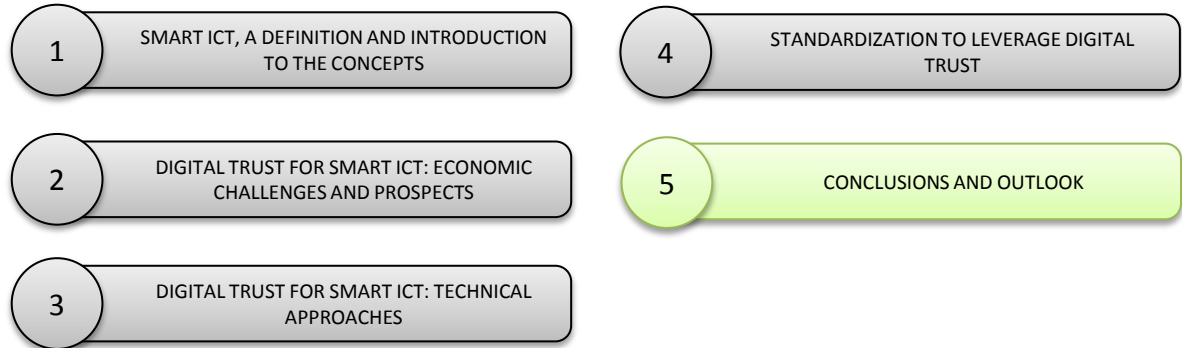
*To accomplish a fully interoperable and trusted global IoT network depends on: Interoperability and Security & Privacy. Standards could support it. Existing standards are **fragmented and sometimes even conflicting and overlapping**. Time to join efforts and support IoT Technical standardization development. How ? **Join the network of international experts through ILNAS.***



White Paper
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 FOR SMART ICT**
 Version 3.0, October 2016



 **COMMISSION OF THE EUROPEAN UNION**



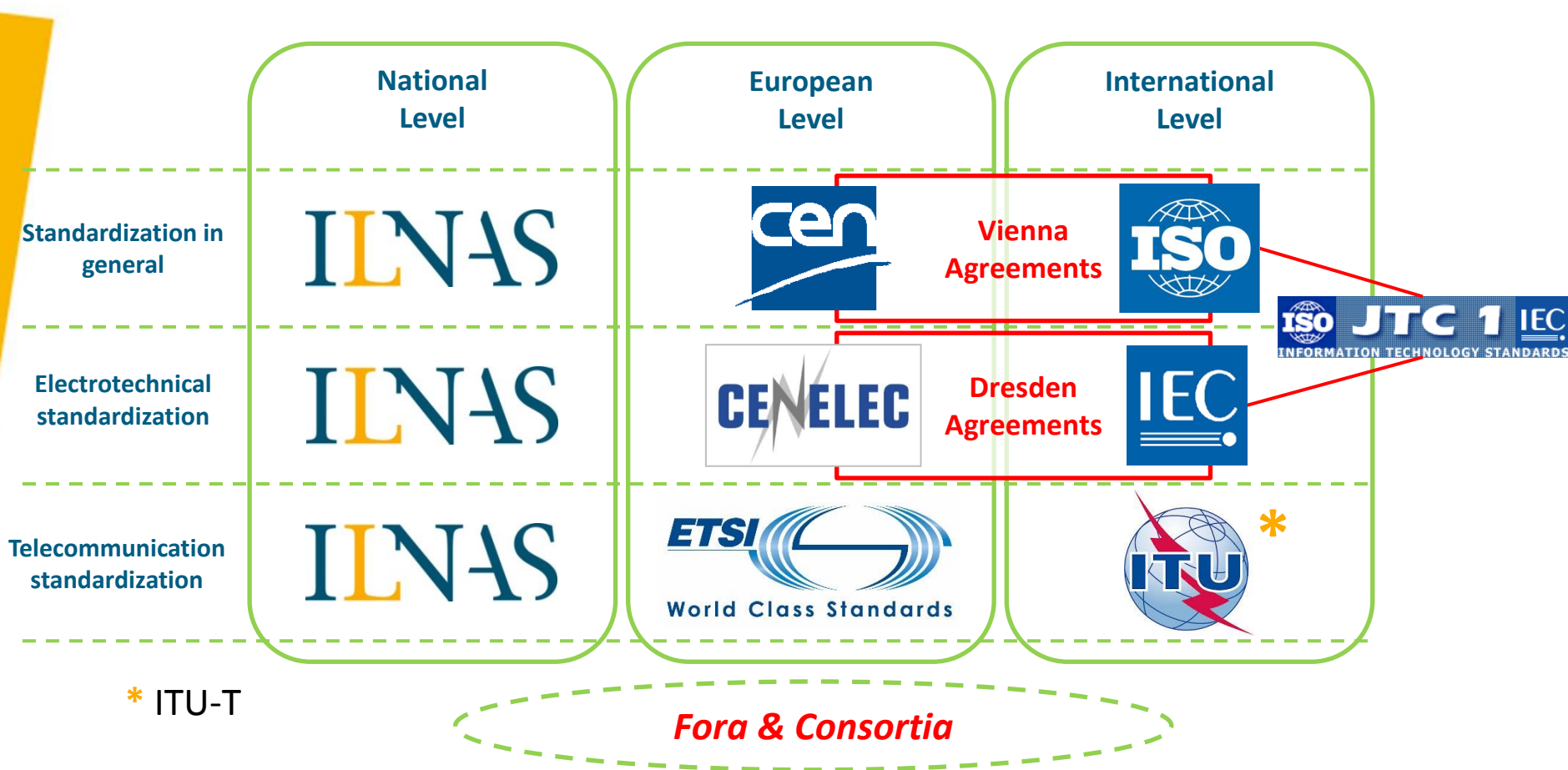
- **Review of each Smart Technology development prospective**
- **Stress out Digital Trust importance and impact**
- **Highlight standardization value for technological evolution**
- **Outlook IoT**
 - **IoT is changing the very foundation of competition**
 - **Drives new business models including industrial automation, energy distribution, logistics and agriculture.**
 - **Further adoption of IoT and achievement of its full potential will depend on:**
 - **Interoperability and Security & Privacy**



ICT Technical Standardization in Luxembourg

Mr. Nicolas DOMENJOURD - ANEC GIE

Recognized standardization organizations



* ITU-T

ICT Standardization in Luxembourg : ILNAS positioning

- ▶ Luxembourg Standardization Strategy 2014-2020
 - **ICT technical standardization is the Pillar I**

- ▶ Luxembourg's Policy on ICT technical standardization for 2015-2020
 - To foster and strengthen the national ICT sector involvement in standardization work through **three leading projects**:
 1. Developing market interest and involvement
 2. Promoting and reinforcing market participation
 3. Supporting and strengthening the Education about Standardization (EaS) and related research activities



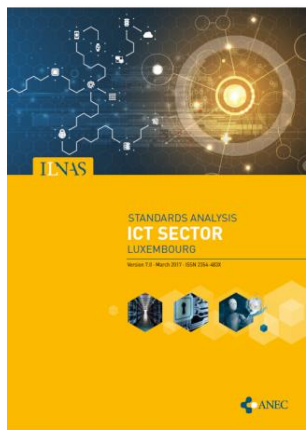
Luxembourg's policy on ICT technical standardization 2015-2020

1 Developing the interest and the involvement of the market

- ▶ 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

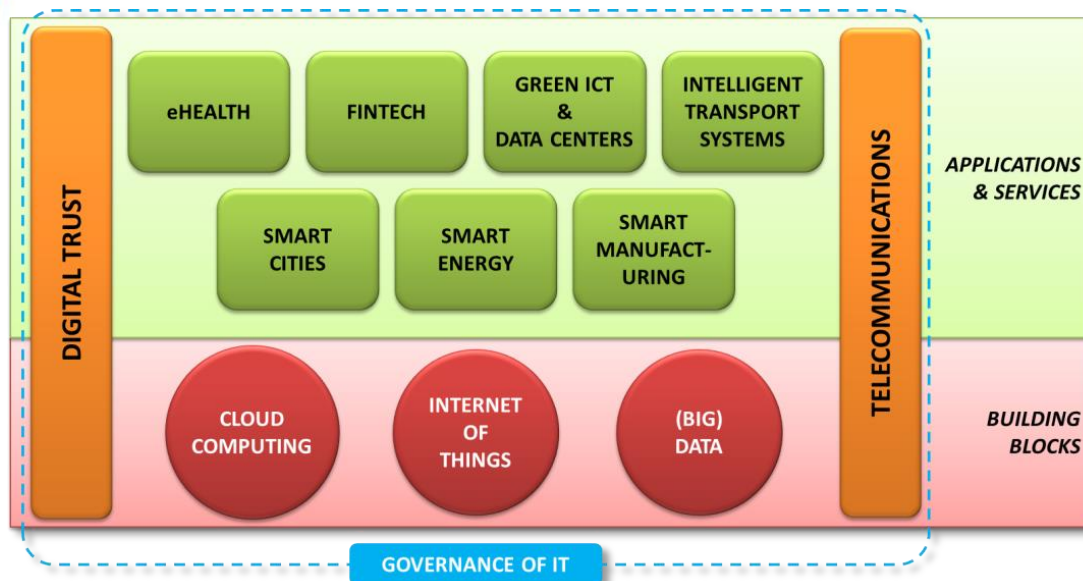
- ▶ Defining a **national implementation plan for ICT technical standardization**
 - To involve targeted stakeholders of the Grand Duchy of Luxembourg in a global approach to standardization
 - Enhancing the international recognition of the Grand Duchy of Luxembourg

Standards Analysis ICT Sector Luxembourg (7th version – March 2017)



▶ 23.03.2017 – Publication of the new ANS TIC

- Tool to promote and raise awareness about ICT standardization
- Offers an overview of ICT standardization developments at national, European and international levels
- Facilitates the identification of standardization technical committees relevant for their activities by national stakeholders
- Highlights the standardization-related opportunities proposed by ILNAS and ANEC EIG at national level



- **13 “Subsectors”** covering the main interests of the national market
- **65 Technical Committees** presented through detailed identification cards

<https://portail-qualite.public.lu/content/dam/qualite/publications/normalisation/2017/standards-analysis-ict-7-0.pdf>

Luxembourg's policy on ICT technical standardization 2015-2020

2 Promoting and reinforcing the participation of the market

▶ Participating in relevant technical committees

■ Closely follow relevant ICT standardization committees

- ISO/IEC JTC1 - Information technology
 - ISO/IEC JTC 1/WG 9 - Big Data
 - **ISO/IEC JTC 1/WG 10 - Internet of Things**
 - ISO/IEC JTC 1/SC 38 - Cloud Computing and Distributed Platforms
- And more...
 - Various ETSI technical committees



▶ Provide information to the national community

- Share ICT standardization knowledge, with related community in Luxembourg
- Organization of related workshops at national level
 - ICT prospective developments
 - Smart ICT domain

Luxembourg's policy on ICT technical standardization 2015-2020

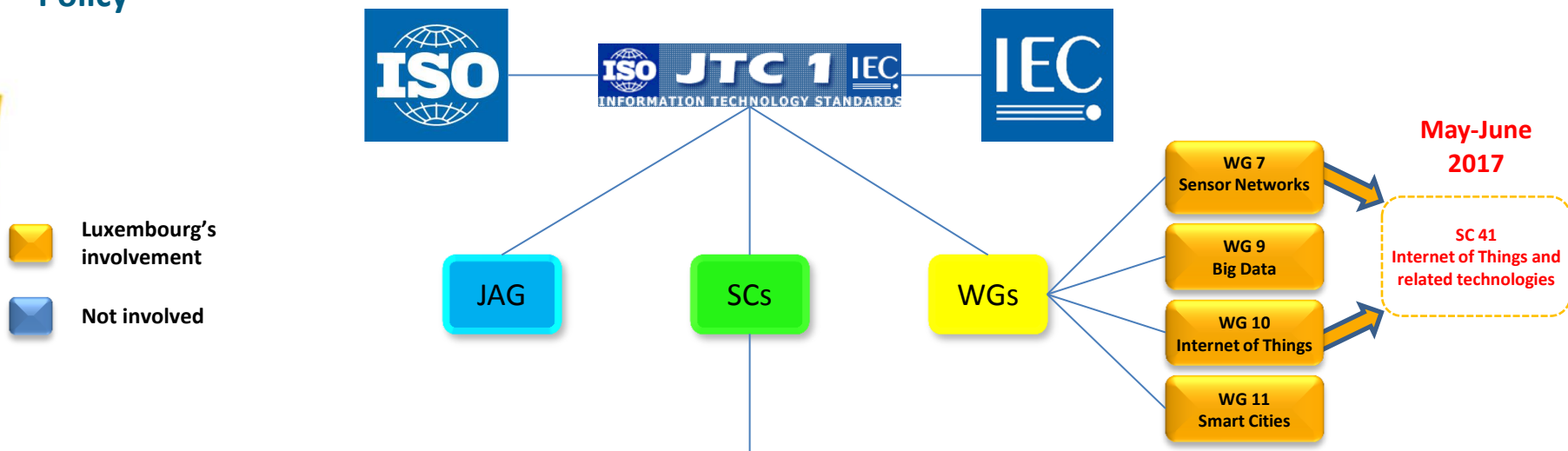
3

Supporting and strengthening the education about standardization and related research activities

- ▶ Managing the **university certificate “Smart ICT for Business Innovation”**
- ▶ **Developing research activities** (potential developments)
 - Future PhDs on “Smart ICT” topics
 - White Papers on “ Digital Trust & Smart ICT ” (Regularly updated)
 - Development of a research program dedicated to the domains of “ICT Technical Standardization”
- ▶ **Prospective of new diplomas** (potential developments)
 - Proposal concerning a dedicated ICT standardization Master’s Degree



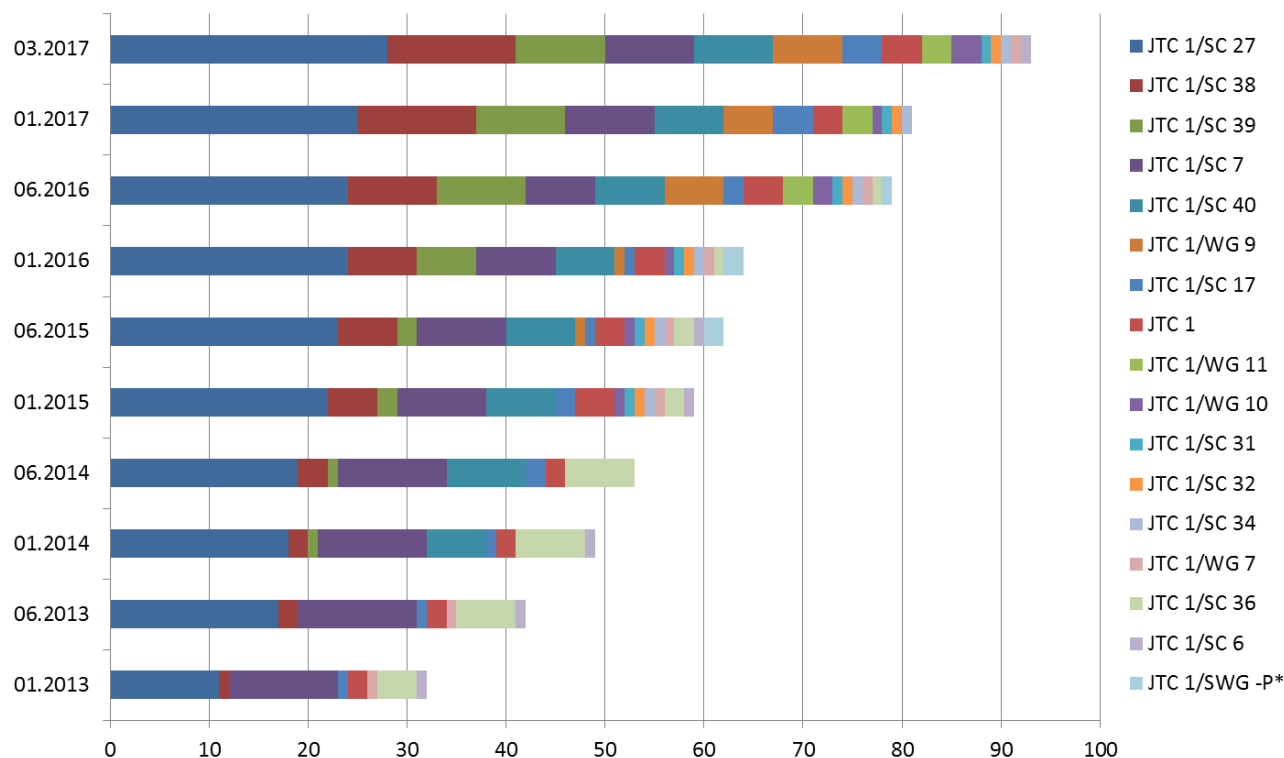
ISO/IEC JTC 1 representation at the national level : Direct outcomes from the ICT Standardization Policy



SC 2 Coded Character Sets	SC 6 Telecommunications and information exchange between systems	SC 7 Software and Systems Engineering	SC 17 Cards & Personal Identification	SC 22 Programming Languages	SC 23 Digitally recorded media for information interchange and storage	SC 24 Computer graphics, image processing, and environmental data representation	SC 25 Interconnection of information technology equipment	SC 27 IT security techniques	SC 28 Office equipment
SC 29 Coding of audio, picture, multimedia and hypermedia information	SC 31 Automatic identification and data captures techniques	SC 32 Data management and interchange	SC 34 Document description and processing languages	SC 35 User interfaces	SC 36 Information technology for learning, education and training	SC 37 Biometrics	SC 38 Cloud Computing and Distributed Platforms	SC 39 Sustainability for and by information technology	SC 40 IT Service Management and IT Governance

National mirror committees

- ▶ Definition: committee at the national level of an European or international committee (or subcommittee)
- ▶ ISO/IEC JTC 1: **10 SC** and **4 WG** are currently active at the national level
- ▶ **63 delegates** from Luxembourg are involved in ISO/IEC JTC 1 (a delegate can be registered in several committees)



* Terminated

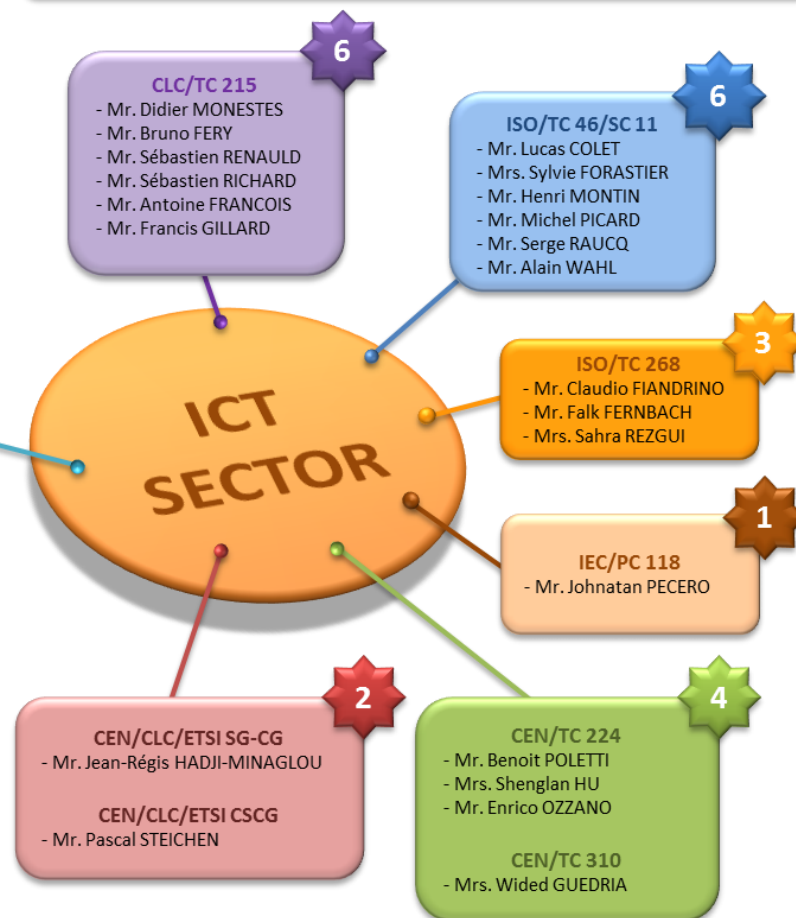
National ICT standardization delegates

At the national level, the ICT sector is already an active standardization sector with currently **72 national delegates**

63

- ISO/IEC JTC 1 (4)**
 - Mr. Jean-Philippe HUMBERT
 - Mr. Nicolas DOMENJOU
 - Mr. Johnatan PECERO
 - Mr. Shyam WAGLE
- ISO/IEC JTC 1/SC 6 (1)**
 - Mr. Shyam WAGLE
- ISO/IEC JTC 1/SC 7 (9)**
 - Mr. Alain RENAULT
 - Mrs. Béatrix BARAFORT
 - Mr. Stéphane CORTINA
 - Mrs. Jeanette EWEN
 - Mr. Christophe FELTUS
 - Mr. Dietmar GEHRING
 - Mr. Michel PICARD
 - Mr. Pierre-Olivier PORTMANN
 - Mr. Armand KOUAKOU
- ISO/IEC JTC 1/SC 17 (4)**
 - Mr. Valentin LACAVE
 - Mr. Benoit POLETTI
 - Mr. Enrico OZZANO
 - Mr. Abdelkrim NEHARI
- ISO/IEC JTC 1/SC 27 (28)**
 - Mr. Benoit POLETTI
 - Mr. Cédric MAUNY
 - Mr. Carlo HARPE
 - Mr. Matthieu AUBIGNY
 - Mrs. Emelyne BAUDRIER
 - Mr. Hervé CHOLEZ
 - Mr. Stéphane CORTINA
 - Mrs. Myriam DJEROUNI
 - Mr. Nicolas DOMENJOU
 - Mrs. Mélanie GAGNON
 - Mr. Clément GORLT
 - Mrs. Shenglan HU
 - Mr. Tom LECLERC
 - Mr. Nicolas MAYER
 - Mr. Alex MCKINNON
- ISO/IEC JTC 1/SC 31 (1)**
 - Mrs. Maria SOTIRI
- ISO/IEC JTC 1/SC 32 (1)**
 - Mr. Johnatan PECERO
- ISO/IEC JTC 1/SC 34 (1)**
 - Mr. David NARAMSKI
- ISO/IEC JTC 1/SC 38 (13)**
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 - Mrs. Myriam DJEROUNI
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 - Mr. Shyam WAGLE
 - Mr. Jean RAPP
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 - Mr. Joost PISTERS
 - Mr. Christophe DELOGNE
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- ISO/IEC JTC 1/WG 9 (7)**
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 - Mr. Nicolas DOMENJOU
 - Mr. Johnatan PECERO

22 New delegates in 2016



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

- ▶ **Created: 2014**
- ▶ **Main focus areas:**
 - **Develop foundational standards for IoT**
 - **Work on IoT standardization gaps**
 - **Establish liaisons with other entities undertaking work related to IoT**
 - **Encourage exchange of information between entities working on IoT**
 - **Monitor the ongoing IoT regulatory, market, business and technology requirements**
 - **Develop other IoT standards that build on the foundational standards**
- ▶ **Projects under development: 3 International Standards and 1 Technical Report**
- ▶ **Chairperson: Mr. Sangkeun Yoo (Republic of Korea)**
- ▶ **Members: 31 countries:** Republic of Korea, Australia, Austria, Belgium, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Hungary, India, Ireland, Israel, Italy, Japan, **Luxembourg**, Mexico, Netherlands, New Zealand, Norway, Russian Federation, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, United Kingdom, United States
- ▶ **Luxembourg's involvement:**
 - Mr. Shyam WAGLE (ANEC EIG)
 - Mr. Hervé COLLIGNON (e-TIC Consulting)
 - Mr. Cyril CASSAGNES (KPMG Luxembourg)
 - Mr. Sankalp GHATPANDE (itrust consulting)
 - Mr. Jean LANCRENON (itrust consulting)



New developments in ISO/IEC JTC 1

- ▶ Establishment of JTC 1 **Subcommittee SC 41 “Internet of Things and related technologies”** decided in November 2016
 - Scope: **Standardization in the area of Internet of Things and related technologies**
 - Serve as the focus and proponent for JTC 1's standardization program on the Internet of Things and related technologies, including Sensor Networks and Wearables technologies
 - Provide guidance to JTC 1, IEC, ISO and other entities developing Internet of Things related applications
 - Structure:
 - Working group on **Sensor Networks** (will replace JTC 1/WG 7)
 - Working group on **Internet of Things** (will replace JTC 1/WG 10)
 - Study group on **Wearables technologies**
 - First meeting (official launch)
 - Seoul, Korea / 28 May – 2 June, 2017



Summary of IoT standards and projects (1/2)

Standard and/or project	Responsible SC	Stage
ISO/IEC 20924 Information technology -- Internet of Things (IoT) -- Definition and vocabulary	WG 10 (SC 41)	Under development
ISO/IEC 21823-1 Internet of things (IoT) -- Interoperability for internet of things systems -- Part 1: Framework	WG 10 (SC 41)	Under development
ISO/IEC TR 22417 Information technology -- Internet of things (IoT) use cases	WG 10 (SC 41)	Under development
ISO/IEC 30141 Internet of Things Reference Architecture (IoT RA)	WG 10 (SC 41)	Under development
ISO/IEC 29161:2016 Information technology -- Data structure -- Unique identification for the Internet of Things	SC 31	Published



Summary of IoT standards and projects (2/2)

Standard and/or project	Responsible SC	Stage
ISO/IEC 18574 Information technology -- Internet of Things (IoT) in the supply chain -- Containerized cargo	SC 31	Under development
ISO/IEC 18575 Information technology -- Internet of Things (IoT) in the supply chain -- Products & product packages	SC 31	Under development
ISO/IEC 18576 Information technology -- Internet of Things (IoT) in the supply chain -- Returnable transport items (RTIs)	SC 31	Under development
ISO/IEC 18577 Information technology -- Internet of Things (IoT) in the supply chain -- Transport units	SC 31	Under development

- ▶ New proposals under study that could be added to the future SC 41 program of work:
 - ISO/IEC NP 21823-2, Information technology – Internet of Things (IoT) – **Interoperability for Internet of Things Systems – Part 2: Network connectivity**
 - ISO/IEC NP 21823-3, Information technology – Internet of Things (IoT) – **Interoperability for Internet of Things Systems – Part 3: Semantic interoperability**

ICT Standardization in Luxembourg : New services supporting delegate's involvement - **Coaching for national standardization delegates**



- ▶ First step (available now)
 - Personalized support for the handling of collaborative work platforms and voting system
 - On demand for the national standardization delegates of the ICT sector
 - Complement the Training session “New delegate in standardization”
- ▶ Second step (development during 2017)
 - New tools & services based on the needs and barriers identified in step 1
- ▶ Objectives
 - Set up good practices common to all national delegates of the ICT sector
 - Facilitate the standardization work of national delegates
 - Understanding of the standardization environment
 - Organization of the national mirror committees
 - Encourage a stronger involvement of the national standardization community

Contact: anec@ilnas.etat.lu



Internet of Things Research & Standardization

Dr. Grégoire DANOY, Scientific Collaborator – University of Luxembourg



Internet of Things Research & Standardization

Dr. Matthias BRUST, Research Associate - University of Luxembourg (SnT)

ILNAS



Discussions

CONTACT



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de l'accréditation, de la sécurité et qualité
des produits et services

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