4th SG13 Regional Workshop for Africa on "Future Networks for a better Africa: IMT-2020, Trust, Cloud Computing and Big Data" (Accra, Ghana, 14-15 March 2016)

Standardization for trust provisioning in the future ICT infrastructure

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Introduction

Towards Human Centric Knowledge Society

- Care for people with ICT to support problem solving in our lives
- Changes in ICT provision to more user friendly, fun and enjoyable experience





ICT is a Basis of Knowledge Society

- ICT evolution affects the means of knowledge creation and processing
- If knowledge is exploited for malicious intentions, it could suffer from irreparable damage and uncertain dangers.
- Identify and prevent risks of knowledge in the complicated ICT infrastructure.





Risks of Knowledge Societies

- Risks on Data Integrity
 - Maintain the accuracy and consistency of data.
- Risks of the **Operation of Systems**
 - The advent of S/W and H/W accelerates the deployment of autonomic processing and operation of systems.

Social Networking Risks

 False knowledge propagation gives rise to great confusion in societies.





Future ICT Infrastructure

- Enhancements of networking/ service scope/capabilities
 - Extension of service
 - Extension of **network**
 - Extension of end-user





Source: Technology 2020 (The Future Company)





Social-Cyber-Physical Infrastructure



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Increasing Intelligence

- Behave intelligently and rationally to
 - Sense real-world behaviour
 - Perceive the world using information models
 - Adapt to different environments and changes
 - Learn and build knowledge
 - Act to control their environments

Intelligence vs. Trust





Trust

• Reliance on another person or entity





Knowledge & Trust





Trust Relationships

Social trust among humans and things



From individual trust to community trust





The concept of trust in the SCP infrastructure



T-SCPI Architecture

- Build up Trustworthy Social-Cyber-Physical Infrastructure (T-SCPI)
 - Trust-enabled infrastructure
 - Knowledge centric networking and services





Key Design Principles

Consider Trust as a Key Component for Future ICT Infrastructure

- Interactions and relationships among Social/Cyber/Physical worlds
- Trustable intelligent services based on data convergence and mining
- Trustworthy environment for correct
 operations
- Enhanced security and privacy





Trust Management

- Identity management
- Trust management
 - Reputation
 - Recommendation
- Dynamics
 - Adaptive knowledge based control







Measure, Calculate & Decision Making

Trust level

- Measurable trust Metrics
- Trust calculation Subjective vs. Objective
- Decision Making
 - From sensing to actionable knowledge and trustbased decision making





Trust Architectural Framework







Use Cases



Standardization – 1

Trust considerations as an important item for standardization

- ITU-T SG13 Correspondence Group on Trust
 - Started new work on future trusted ICT infrastructures to cope with emerging trends in ICT while also considering social and economic issues.



 Currently developing a technical report on trust provisioning of ICT infrastructures.





Standardization – 2

- Other SDOs
 - Until now, focusing on network security and cybersecurity
 - To be expanded to take into consideration trust issues
 - Online Trust Alliance, Trusted Computing Group
 - Still limited to social trust between humans
 - Further consideration on trust between humans and objects as well as across domains of SCP and services





Standardization – 3

- Work Items for Future Standardization in ITU-T
 - Overview of trust in ICT
 - Service scenarios and capabilities
 - Requirements for trust provisioning
 - Architectural framework
 - Technical solutions for trust provisioning
 - Trust provisioning in 5G/Cloud Computing/IoT
 - Trust provisioning in data analytics





Impact of SCP Trust Standardization







Summary









Intelligence vs. Trust

Future ICT Infrastructure

Trustworthy Social-Cyber-Physical

Infrastructure

Trust-enabled knowledge-centric networking and services









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