
Future Network Projects Overview of ISO/IEC JTC1/SC6

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Introduction

❑ **Future Internet**

- Future of the Internet

❑ **Future Network(s)**

- Network(s) of the Future
- Term used in Standardization Body such as JTC 1/SC 6, ITU-T Focus Group-FN, ITU-T SG 13
- ISO/IEC JTC1/SC6: Future Network
- ITU-T FG-FN and SG 13: Future Networks

❑ **Relevant Activities**

- USA: GENI, FIND
- EU/FP7: FIRE
- Japan: AKARI
- Korea: Future Internet, Future Network

Introduction

- ❑ **ISO/IEC JTC 1: “Information Technology”**
- ❑ **JTC 1/SC 6 : “Telecommunications and Information Exchange between Systems”**
 - WG 1 – Services and protocols in the physical and data link layers
 - **WG 7 – Network, Transport, and Future Network**
 - Changed in JTC 1/SC 6 June 2011 meeting
 - Including Architecture, Upper Layers and Applications related issues except the scope of other WGs of SC 6
 - WG 8 – Services and protocols in Directory
 - WG 9 – Specification of Abstract Syntax Notation one (ASN.1), its Encoding Rules, Generic Applications and related Registration Authorities

History of FN Standardization in SC6

- ❑ **SC 6 Meeting, April 2007 (Xian, China)**
 - Initial Discussions in HoD/C Meeting
- ❑ **SC 6 Ad Hoc Meeting on Future Network, 5-6 Sept. 2007 (Paris, France)**
 - Participation: Korea, China, France, Canada, Japan, ECMA, ITU-T, etc.
 - Future Network Definition, Issues
 - Work methods and Procedures
 - Problem Statement
 - Requirements
 - Gap Analysis
 - Framework
 - Architecture
 - Individual Technologies

History of FN Standardization in SC6

- ❑ **SC 6/WG 7, April 2008 (Geneva, Switzerland)**
 - Review contributions and Discussions on;
 - Problem Statement, Requirements, Gap Analysis
 - Developed NP text
 - **Initiated NP ballot in JTC 1/SC 6**
 - Title: Future Network: Problem Statement and Requirements
- ❑ **SC 6/WG 7, Nov. 2008 (Montreux, Switzerland)**
 - **Approved as a New Project by 10 National Bodies**
 - China, Czech Republic, France, Japan, Korea, Spain, UK, Germany, Netherlands, Switzerland
- ❑ **SC 6/WG 7, June 2009 (Tokyo, Japan)**
 - Initial discussions on **FN Naming and Addressing**

History of FN Standardization in SC6

- ❑ **SC 6/WG 7, January 2010 (Barcelona, Spain)**
 - Initial text: Naming & Addressing, Switching & Routing
- ❑ **SC 6/WG 7, September 2010 (London, UK)**
 - **Project Subdivision of ISO/IEC 29181**
 - 7 Multi-part document structure: 29181-1 ~ 7
 - Approved **PDTR ballot** of **ISO/IEC 29181-1**
- ❑ **SC 6/WG 7, February 2011 (London, UK)**
 - Developed updated WD texts of 29181-2(Naming and Addressing), 29181-3(Switching and Routing)
 - **First WD texts of 29181-6(Media Transport), 29181-7(Service Composition)**
 - **Initial proposal on new work on Federation of FN**

History of FN Standardization in SC6

❑ **SC 6/WG 7, June 2011 (San Diego, USA)**

- Developed updated WD texts of 29181-2(Naming and Addressing), 29181-6(Media Transport), 29181-7(Service Composition)
- Initiated DTR Ballot for 29181-1 (Overall aspects)
- First WD text of 29181-4(Mobility), 29181-5(Security)
- Approved new work item 29181-8(Federation) part and first WD text

❑ **SC 6/WG 7, September 2011 (Barcelona, Spain)**

- Developed update text of 29181-2(Naming and Addressing), 29181-6(Media Transport), 29181-7(Service Composition)

JTC 1/SC 6's Considerations on FN

- ❑ **Future Network is the Network of the Future**
 - It does not mean only the networking aspects
 - It includes all aspects of Networking as well as Services
 - **ITU-T's Term: Future Networks**
 - ITU-T SG13 expects various **FNs** in the future
 - It also includes Evolutionary Approach
- ❑ **No specific network technologies are pre-assumed**
- ❑ **Clean-slate design Approach**
 - It means that a system and network are designed from scratch. It should be based on **long-term, revolutionary approach**. In clean-slate design approach, the backward compatibility may not be required.
- ❑ **This work is distinct from NGN and will not compromise nor endanger currently operated networks**

JTC 1/SC 6's Considerations on FN

- ❑ **SC6's view on NGN of ITU-T**
 - Packet based Technologies but assuming IP-based Network Architecture
 - Evolution from the current IP-based Network
 - Short/Mid-term Evolutionary Approach

- ❑ **Recently, ITU-T SG13 started new work on SUN(Smart Ubiquitous Network)**
 - IP-based Technology
 - Futuristic technologies and mechanisms for FNs can be applied to achieve SUN
 - **SUN is positioning between NGN and Future Networks**

Current Projects on Future Network

- **ISO/IEC 29181: Future Network - Problem statement and requirements**

Std. No.	Title	Status
29181-1	FNPSR Part 1: Overall aspects	DTR
29181-2	FNPSR Part 2: Naming and Addressing	3 rd WD
29181-3	FNPSR Part 3: Switching and Routing	3 rd WD
29181-4	FNPSR Part 4: Mobility	1 st WD
29181-5	FNPSR Part 5: Security	2 nd WD
29181-6	FNPSR Part 6: Media Transport	3 rd WD
29181-7	FNPSR Part 7: Service Composition	3 rd WD
29181-8	FNPSR Part 8: Federation	1 st WD

ISO/IEC 29181-1: Overall aspects

- ❑ **29181-1: Future Networks : Problem Statement and Requirements – Overall aspects**
- ❑ **Scope**
 - Motivation of FN
 - Definition, general concept, and terminologies of FN
 - Services and applications in FN
 - Problems with current networks
 - Design goals and high-level requirements for FN
 - Milestones for standardization on Future Network
- ❑ **Definition of Future Network**
 - The FN is the **network of the future** which is made **on clean-slate design approach** as well as **incremental design approach**. It should **provide futuristic capabilities and services** beyond the limitations of the current network including the Internet.

ISO/IEC 29181-1: Overall aspects

- ❑ **The key features that the FN services should support include:**
 - Context Awareness
 - Dynamic Adaptiveness
 - Self Organization and Self-Configuration
 - Self-Detection and Self-Healing
 - Distributed control
 - Mass data control

ISO/IEC 29181-1: Overall aspects

- ❑ **New Design Goals and High level requirements for Future Network**
 - Scalability
 - Naming and addressing scheme
 - Security
 - Mobility
 - Customizable quality of service
 - Heterogeneity and network virtualization
 - Service awareness
 - Media transport
 - New layered architecture
 - Management
 - Energy efficiency
 - Economic incentives

ISO/IEC 29181-2: Naming and Addressing

- ❑ **29181-2, FNPSR - Part 2: Naming and Addressing**
- ❑ **Scope**
 - It describes the general characteristics of Future Network NAS Schemes including;
 - Requirements: The general characteristics of Future Network are discussed and their impact on NAS design
 - Problem Statement: the characteristics and deficiencies of existing NAS in old networks will be discussed
 - Gap analysis: Examines the gap between old network NAS and future network performance expectations
 - Design Objectives: Specify objectives and principles for NAS design. The design principles are major rules that FN-NAS designers should consider and follow in their design activities.

ISO/IEC 29181-2: Naming and Addressing

□ Scope (Cont.)

- Technical Challenges: a list of major technical challenges, overcoming of which would help assure that the new NAS will be able to provide solid technical support from the base level to satisfy the ambitious objectives of Future Network
- Development Guidance: How to future NAS standardization can progress
- Excluded from this TR is discussion of specific NAS mechanisms unless they are used as examples to explain technical concepts
 - Rather than presentation of a specific technology, the report will focus on the general issues surrounding naming and addressing

ISO/IEC 29181-3: Switching and Routing

❑ 29181-3, FNPSR - Part 3: Switching and Routing

❑ Scope

- contains the problem statement and requirements for switching and routing in the Future Network, in particular:
 - description of the requirements for carrying data over digital networks;
 - description of the ways in which these requirements are not satisfied by current networks;
 - functional architecture for switching and routing in the Future Network; and
 - requirements for control plane information flows for finding, setting up, and tearing down routes
 - The requirements include support for both current (“legacy”) and future (“new”) switching technologies, to aid the transition between them

ISO/IEC 29181-4: Mobility

- ❑ **29181-4, FNPSR - Part 4: Mobility**

- ❑ **Scope**

- Describes the problem statements of current network and the requirements for Future Network in the mobility perspective. Specifically, this Technical Report mainly specifies;
 - Problems of the current network in mobile environment;
 - Requirements for mobility support in Future Network;
 - information on Existing mobility control schemes in the current network;
 - Examples of high-level mobility control architecture for Future Network

ISO/IEC 29181-5: Security

- ❑ **29181-5, FNPSR - Part 5: Security**
- ❑ **Scope**
 - It describes the general characteristics of Future Network Security Schemes including;
 - Requirements: The general characteristics of FN are discussed and their impact on FN Security design
 - Problem Statement: the characteristics and deficiencies of existing Security in old networks
 - Gap analysis: Examines the gap between old network security and FN performance expectations
 - Design Objectives: Specify objectives and principles for FN Security design
 - Technical Challenges: a list of major technical challenges to overcome

ISO/IEC 29181-6: Media Transport

- ❑ **29181-6, FNPSR - Part 6: Media Transport**

- ❑ **Scope**

- describes the problem statement and requirements for future network in the perspective of Media Transport
 - detailed description on the media transport requirements in the Future Network
 - identification and definition of services, basic and media services, which will fit the requirements for communications over heterogeneous environments and users, for any kind of media content
 - functional architecture for media transport in the FN
 - requirements and functionalities of Media Aware Network Elements, which are intended to be nodes in the network to provide seamless media experiences to users;

ISO/IEC 29181-7: Service Composition

- ❑ **29181-7, FNPSR - Part 7: Service Composition**
- ❑ **Scope**
 - describes the problem statement, requirements and a service-oriented functional architecture for the FN from the perspective of service composition;
 - Analyze and classify problems of the current solutions on the service composition (SC)
 - Study various on-going standardization and research activities related to SC
 - Identify requirements on the SC for the FN
 - Describe some technical aspects of the SC for the FN
 - Describe use cases to support different features of the SC,
 - Propose a Service-oriented functional architecture including functional blocks and basic SC mechanisms for the FN

ISO/IEC 29181-8: Federation

- ❑ **29181-8, FNPSR - Part 8: Federation**
- ❑ **Scope**
 - Describes the Problem statements and Requirements aspects of FN Federation;
 - Motivation of federation
 - Problem with interconnection of multiple heterogeneous networks
 - Classification of federation scenarios
 - General requirements of federation

Project Editors for 29181

Std. No.	Title	Editors
29181-1	Overall aspects	M. K. Shin, J. Alcober
29181-2	Naming and Addressing	J. Xie, K. Zhang, H.K. Kahng
29181-3	Switching and Routing	J. Grant, H.K. Kahng
29181-4	Mobility	S.J. Koh, M. Roshanaei
29181-5	Security	H. Wang, Y. Liu
29181-6	Media Transport	Francisco Iglesias, Sung Hei Kim, Xavier Miguelez
29181-7	Service Composition	Alberto Gonzalez, Jong-Hwa Yi, Ramon Martin de Pozuelo
29181-8	Federation	Myung-Ki Shin

Future Issues on FN

- ❑ **Future Network of Things**
 - Internet of Things (IoT)
 - What issues should be taken into account in FN?

- ❑ **FN Architecture**

- ❑ **Functions and Facilities to support each part of ISO/IEC 29181**

- ❑ **Energy saving ?**

- ❑ **What else ?**

Collaboration with ITU-T SG 13

- ❑ **JTC 1/SC 6 has been communicating with ITU-T FG-FN and ITU-T Q.21/13**
 - Exchanging LS and Sharing Deliverables of each group
- ❑ **JTC1/SC 6/WG 7 and ITU-T Q.21/13 established a Correspondence Group (January 2011)**
 - to identify common interest topics for collaboration
 - to develop common text or technically aligned text for ISO/IEC International Standard/ITU-T Recommendations
 - [Mailing list: fncollaboration@lists.itu.int](mailto:fncollaboration@lists.itu.int)
 - open to non-ITU-T members
 - Co-Convenors
 - Mr. Takashi Egawa (NEC, Japan) – Q.21/13 Rapporteur
 - Mr Shin-Gak Kang (ETRI, Korea) – SC6/WG7 Convenor
 - **“Correspondence Group” confirmed at October 2011 (SG13)**

Collaboration with Other ITU-T SGs

□ ITU-T SG 2

- SG2 offers Collaboration on **FN Naming & Addressing** issues
- Considering **Common Text** document bet. JTC 1 & ITU-T
- It will be discussed at February 2012 SC 6 meeting
- * Note: Naming & Addressing issues also related with relevant activities on “Identification issues” of ITU-T SG13

□ ITU-T SG 17

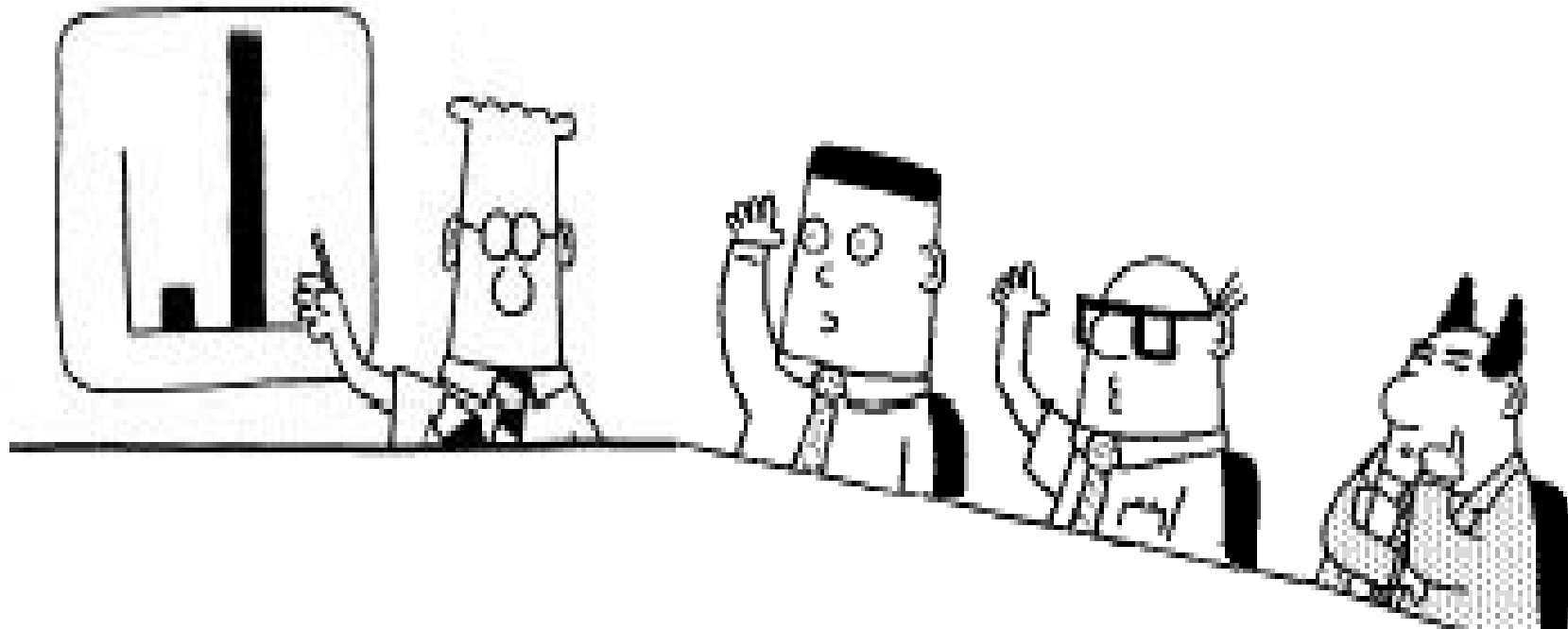
- SG117 offers Collaboration on **FN Security** issues
- Considering Common Text document bet. JTC 1 & ITU-T
- It will be discussed at February 2012 SC 6 meeting

Future Meeting Plan of SC 6 & WG 7

- ❑ **Regular Meeting of JTC 1/SC 6 and WGs**
 - 27 February ~ 2 March 2012 (Guangzhou, China)
 - 17-21 September 2012 (Graz, Austria)

- ❑ **SC6/WG7 will setup additional WG7 meetings later for further progression of FN standardization work**

Any Questions ?



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