ISO/IEC JTC 1 N9380

2008-10-24

Replaces:

ISO/IEC JTC 1
Information Technology

Document Type:	report
Document Title:	SGSN Report to JTC 1
Document Source:	SGSN Convener
Document Status:	This document is circulated to JTC 1 National Bodies for review and consideration at the November 2008 JTC 1 Plenary meeting in Nara.
Action ID:	ACT
Due Date:	
No. of Pages:	18

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SGSN Report to JTC 1

October 2008

Submitted by Yongjin Kim, Convenor of SGSN

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Introduction

- SGSN was established at the 22nd ISO/IEC JTC 1 Plenary meeting, 13th October 2007 in Gold Coast, Australia. Its ToR was given in Resolution 19 of JTC 1 Gold Coast Plenary.

SGSN Terms of Reference approved at JTC 1 Gold Coast Plenary

1) Review the current definitions, visions and requirements for target applications of Sensor Networks within JTC1 and outside JTC1 in connection with different application areas (e.g. home, medical informatics, transport informatics, industrial communications, RFID etc) as well as JTC 1 SCs roles in these application areas

2) Review and identify

• the unique characteristics of Sensor Networks and the commonalities and differences with other networks

• the system architectures of Sensor Networks in terms of functionalities
• the entities that together comprise Sensor Networks and their characteristics
• existing protocols that can be used for Sensor Networks and the elements of protocols that are unique to Sensor Networks
• the scope of infrastructure that can be considered to be a Sensor Network
• the types of data that need to be handled (acquired, processed, transported, stored, rendered etc) by Sensor Networks and any specific QoS attributes required by those categories
• the interfaces that need to be supported by Sensor Networks
• the services that need to be supported by Sensor Networks
• aspects such as security, privacy, identification that may be relevant to specific Sensor Networks

3) Monitor other activities in international standardisation bodies and consortia and fora where specifications related to Sensor Networks are being developed.

4) Produce a report covering 1) and 2) above and information on other relevant standardisation activities

5) In the light of published SC scopes and work programmes and the results of 1) to 3) recommend potential areas of work to JTC 1 and appropriate SCs to ensure that all necessary aspects of Sensor Networks within the scope of JTC 1 are standardised.

6) Recommend how the work on Sensor Networks can be efficiently coordinated in JTC 1.

7) Hold workshops to gather requirements or publicise the results.

8) Meetings of the group may be physical or via electronic means

- Convenor of SGSN is Dr. Yongjin Kim (Korea) and Secretariat is Ms. Jooran Lee (Korea).

- SGSN members are as follows:

  - 9 NBs: Canada, China, France, Germany, Japan, Korea, Norway, UK and USA.
  - JTC 1 SC 6, SC 31 and SC 36

- ISO TC 211
- IEC TC 56 and TC 100

- SGSN members list is in Annex 2.

Summary of Activities

- The 1st meeting was held on 26-27 June 2008 in Shanghai, China

  - 53 participants from 5 NBs and 4 LOs attended the meeting.
  - Produced the design specification of SGSN Technical Document for report to JTC 1
  - Approved three resolutions regarding TD and SGSN work plan.
  - The 1st Meeting Report was given in JTC 1 N9169.

- The 2nd meeting was held on 15-19 September 2008 in Nuremberg, Germany

  - 17 participants from 5 NBs and 2 LOs attended the meeting.
  - Produced Version 1 of SGSN Technical Document for submission to JTC 1.
  - Approved four resolutions for further study.
  - Three Recommendations to JTC 1.
  - The 2nd Meeting Report was given in JTC 1 N9277.

- SGSN produced SGSN Technical Document (Ver.1) answering the ToR of SGSN

  - Answered ToR 1 to 5
  - The SGSN Technical Document (Ver. 1) was given in JTC 1 N9359.
  - SGSN Technical Document needs to be improved with more contributions from JTC 1 NBs, SCs and other SDOs.

- Sensor Network Workshop was held on 25 June 2008 in Shanghai, China.

  - Approximately 120 people attended to hear 11 presentations by SGSN members.
  - The Workshop was to gather requirements on sensor networks standardization issues and promote sensor networks.

- SGSN set up Two types of Email explorers

  - sgsn@modacom.co.kr : for official distribution of N-documents and official members discussion.
  - sgsn_open@modacom.co.kr : for open discussion among related sensor network experts from all kinds of organizations.

Recommendations to JTC 1

The following recommendations were submitted to JTC 1 for 2008 JTC 1 Plenary resolutions in Nara, Japan.

- **SGSN Recommendation 1 to JTC 1**

  SGSN recommends that JTC 1 reaffirm SGSN's continued activity up to its Terms of Reference with a report to JTC 1 prior to the 2009 JTC 1 Plenary meeting.

- **SGSN Recommendation 2 to JTC 1**

  SGSN recommends that JTC 1 issue, to JTC 1 National Bodies and its Subcommittees, a Call for Contribution to the SGSN Technical Document on their existing and potential area of standardization on sensor networks.

- **SGSN Recommendation 3 to JTC 1**

  SGSN recommends that standardization on sensor networks should be initiated in JTC 1 as soon as possible to meet the urgent requirements of industry, such as application profiles, requirements analysis, interfaces, identification, etc.

Study on ToR

SGSN Technical Document Ver.1 in JTC 1 N9359 shows the SGSN’s answers to its ToR.

Mapping of ToR to the SGSN Technical Document section or sections

ToR #	Section Number
1	Sections 2, 3, and 4; and all subsections under Sections 2, 3, and 4
2	Sections 5 and 6; and all subsections under Sections 5 and 6
3	Section 8.1
4	The report is produced, which is this SGSN Technical Document.
5	Section 7 and its all subsections (for potential work areas); Section 8.2 (for appropriate SCs); and Section 8.3 (for potential collaboration with non-ISO organizations)
6	Section 8.4
7	Workshop on Sensor Networks was held on 25 June 2008, in Shanghai, China, a day prior to the 1st SGSN face-to-face meeting, 26-27 June 2008.
8	The face-to-face meetings were conducted. The 1st SGSN meeting was held in Shanghai, China, 26-27 June 2008; the 2nd SGSN meeting was held in Nürnberg, Germany, 15-19 September 2008.

- Study on ToR 1

  - More than 11 target applications of Sensor Networks within JTC 1 and outside JTC 1 including logistics and supply chain management, automation, health care system, ITS, and security were studied for their definitions, visions, and requirements.
  - Generic vision and mission statement, definitions and requirements on Sensor Networks in JTC 1 were developed.
  - Refer to Sections 2, 3, and 4 of SGSN Technical Document Ver. 1 (JTC 1 N9359)
  - JTC 1 SCs roles in these application areas need more study.

- Study on ToR 2

  - The unique characteristics of Sensor Networks were analyzed and generic requirements of Sensor Networks based on 11 Sensor Networks applications were defined in Sections 5 of SGSN Technical Document Ver.1 (JTC 1 N9359)
  - A reference architectures of Sensor Networks in terms of functionalities and the entities comprising Sensor Networks were studied and defined in Sections 6 of SGSN Technical Document Ver.1 (JTC 1 N9359)

- Studies on existing protocols that can be used for Sensor Networks were not covered yet, and more studies are needed
- The scope of infrastructure for Sensor Networks were studied and defined in Section 3 of SGSN Technical Document Ver.1 (JTC 1 N9359)
- The types of data that need to be handled by Sensor Networks and the interfaces that need to be supported by Sensor Networks were studied in Section 6.3.3 of SGSN Technical Document Ver.1 (JTC 1 N9359), but need more contributions and studies. Any specific QoS attributes required by those categories were not studied yet.
- The services that need to be supported by Sensor Networks were studied for basic function layer, service layer, and for device management entity in Section 6.3 of SGSN Technical Document Ver.1 (JTC 1 N9359).
- Aspects such as security, privacy, identification that may be relevant to specific Sensor Networks were studied in Section 7, but need more studies.

- Study on ToR 3

  - The following international standardisation bodies and consortia and fora were studied for their specification activities related to Sensor Networks.
    . ISO TC 204,
    . IEC 62026 AS-Interface
    . ITU-T (SG13, 16, 17)
    . IEEE 802.15
    . ZigBee Alliance
    . IETF(6LOWPAN WG, MANET WG, ROLL WG)
    . OGC
  - Refer to Sections 8.1 of SGSN Technical Document Ver.1 (JTC 1 N9359)

- Study on ToR 4

  - A SGSN Technical Document was produced (JTC 1 N9359)

- Study on ToR 5

  - Potential areas of work to JTC 1 and appropriate SCs were analyzed and produced as a table

- More participation, contributions from JTC 1 SCs and more study are requested.

Standardization Areas	ISO/IEC JTC 1 SCs
Terminology	JTC 1
Requirements Analysis	SC 6, SC 17, SC 25, SC 36
Reference Architecture	SC 6
Application Profiles	SC 31, SC 36, SC 37
Sensor Interfaces	SC 6, SC 31, SC 37
Data type and Data Interface	SC 6, SC 32
Communication	SC 6
Routing	SC 6
Mobility Support	SC 6
Network Management	SC 6
Collaborative Information Processing	SC 32
Information Service Supporting	SC 6, SC 24, SC 29, SC 31, SC 32
Quality of Service (QoS)	SC 6
Middleware Functions	SC 32
Security	SC 6; SC 27
Comformance, Interoperability, Performance Testing	None Known

- Study on ToR 6

  - Standardization of sensor networks is a complex issue. The study makes quite clear that a large part of them can be handled by existing SCs. But the information available shows also that many of the aspects are not addressed today. The question is how the gaps can be filled. Different alternatives have been discussed during the meeting in Nuremberg:

    - ✓ Let the existing SCs handle the existing work items as per their scope;
    - ✓ Creation of a new workgroup in a leading SC;

- ✓ Foundation for a new SC (since SGSN believes that the two alternatives above have some disadvantages in coordinating SN standardization activities); or
- ✓ Transform SGSN to a SN Special Working Group under JTC 1 to coordinate the SN standardization activities with JTC 1 SCs, SDOs, consortia, fora and industry, and also to handle standardization of SN need areas that no SC has the work scope.

- The foundation of new SC might be a good idea to handle the complex new technology. Unfortunately, this approach would require a lot of discussion and time. Due to the fact that we need SN standards as early as possible, this alternative is not desirable. A new working group inside an existing SC might not be able to handle the complexity of the issue due to coordination problems. Transforming SGSN to a Joint Task Working Group is a good alternative, but it requires the supports from the JTC 1 SCs and National Bodies; however, such supports need to be cultivated. Currently, the most desirable solution from the SGSN's point of view is therefore that SGSN keeps on study and prepares materials for SN standardization for another year. SGSN needs to promote the participation from JTC 1 SCs, SDOs, Consortia, fora, and industry. The contact to existing SCs has to be intensified, more information on sensor network standardization activities have to be provided to SGSN. SGSN could deliver a second study next year and coordinate the ongoing standardization activities concerning sensor networks.

- Study on ToR 7

  - The Workshop on Sensor Networks was held on 25 June 2008, in Shanghai, China, a day prior to the 1st SGSN physical meeting.

- Study on ToR 8

  - Two physical meetings were conducted. The 1st SGSN meeting was held in Shanghai, China, 26-27 June 2008; the 2nd SGSN meeting was held in Nuremberg, Germany, 15-19 September 2008.

Annex 1

SGSN Document Register (N001-N049)

SGSN Doc No.	Title	Source
N001	Convenor's letter to the members of the SGSN	SGSN Convenor
N002	Meeting announcement and Registration form for 1st Meeting of JTC 1 Study Group on Sensor Networks, Shanghai, China, 25-27 June 2008	SGSN Secretary
N003	Draft agenda for 1st Meeting of JTC 1 Study Group on Sensor Networks, Shanghai, China, 25-27 June 2008	SGSN Convenor
N004	Call for Contributions to the First Meeting of JTC 1 Study Group on Sensor Networks	SGSN Convenor
N005	Logistical information for the 1st JTC 1/SGSN meeting, 25-27 June 2008, Shanghai, China	National Body of China
N006	Workshop Programme and Confirmed Timetable for the 1st Meeting of JTC 1 Study Group on Sensor Networks, Shanghai, China, 25-27 June 2008	SGSN Secretary
N007	Revised draft agenda for the 1st Meeting of ISO/IEC JTC 1 Study Group on Sensor Networks, Shanghai, China, 26-27 June 2008	SGSN Convenor
N008	Wireless Sensor Networks: Applications, Architectures and Protocols	National Body of Germany
N009	On the Requirements of Mobile Wireless Sensor Network	National Body of China
N010	Technical Requirements for Sensor Networks and Standardization Items	National Body of Korea
N011	System Architecture and Standard Framework for Sensor Networks	National Body of China
N012	Sensor Networks from Architecture Perspectives	JTC 1/SC 36
N013	Connecting IPv6 Sensor Network with Internet	National Body of China
N014	Review of JTC 1/SC 6 Standardization Activities on Sensor Networks	JTC 1/SC 6
N015	A standardization initiative of ISO/IEC JTC 1/SC 6	JTC 1/SC 6

	on sensor networks	
N016	ISO/IEC JTC 1/SC 31/WG 6	JTC 1/ SC 31
N017	Standard Developing Activities of ISO/TC 204	National body of Norway
N018	Perspective on sensor networks in Germany	National Body of Germany
N019	Perspective on sensor networks in China	National Body of China
N020	Perspective on IP-Based Sensor Network in Korea	National Body of Korea
N021	Vision on mobile wireless sensor networks	National Body of China
N022	Standardization Issues for Sensor Networks	National Body of Korea
N023	Applications and Requirements of convergence of WSN and cellular network	National Body of China
N024	Sensor Networks from Systems Architecture Perspective	(Proxy) JTC 1/SC 36
N025	Discussion about Networked Sensor Interface	National Body of China
N026	Security principle and solution for WSN	National Body of China
N027	Standardization activities on Standardization activities on sensor networks of sensor networks of JTC 1/SC 6 and other SDOs	JTC 1/SC 6
N028	IEEE 1451 Smart Sensor Networks and Standards	IEEE 1451
N029	ISO/IEC JTC 1/SC 31/WG 6	JTC 1/SC 31
N030	Resolutions of the 1st ISO/IEC JTC 1 SGSN Meeting in Shanghai, China, 26-27 June 2008	1st JTC 1 SGSN Meeting in Shanghai
N031	Report of the 1st ISO/IEC JTC 1 SGSN Meeting in Shanghai, China, 26-27 June 2008	SGSN Secretary
N032	Report of SGSN Ad hoc group 1	SGSN Ad hoc group 1 leader
N033	Report of SGSN Ad hoc group 2	SGSN Ad hoc group 3 leader
N034	Report of SGSN Ad hoc group 3	SGSN Ad hoc group 3 leader
N035	Final agenda for the 1st Meeting of ISO/IEC JTC 1 Study Group on Sensor Networks, Shanghai, China, 26-27 June 2008	SGSN Secretary
N036	Draft agenda for the 2nd Meeting of ISO/IEC JTC 1 Study Group on Sensor Networks, Nuremberg, Germany, 15-19 September 2008	SGSN Convenor
N037	Logistical information of the 2nd meeting of ISO/IEC JTC 1 Study Group on Sensor Networks, 15-19	Meeting Host

	September 2008, in Nuremberg, Germany	
N038	National Body of China's contribution to SGSN Technical Document	National Body of China
N039	NB of Germany and NB of China's contribution to SGSN Technical Document	National Body of Germany and National Body of China
N040	Regarding Actuator – Sensor – Interface for SGSN Technical Document	National Body of Germany
N041	JTC 1/SC 6 Contribution to SGSN Technical Document	JTC 1/SC 6
N042	Definitions of Sensor and Actuator for SGSN Technical Document	IEEE
N043	OGC contribution to SGSN Technical Document	OGC (Open Geospatial Consortium)
N044	Revised Draft agenda for the 2nd Meeting of ISO/IEC JTC 1 Study Group on Sensor Networks, Nuremberg, Germany, 15-19 September 2008	SGSN Covenor
N045	Resolutions of the 2nd ISO/IEC JTC 1 SGSN Meeting in Nuremberg, Germany, 15-19 September 2008	2nd SGSN meeting in Nuremberg
N046	Report of the 2nd ISO/IEC JTC 1 SGSN Meeting in Nuremberg, Germany, 15-19 September 2008	SGSN Secretary
N047	Draft agenda for the 3rd Meeting of ISO/IEC JTC 1 Study Group on Sensor Networks, Sydney, Australia, 19-23 January 2009	SGSN Convenor
N048	Meeting Announcement and Logistical information of the 3rd Meeting of ISO/IEC JTC 1 Study Group on Sensor Networks, Sydney, Australia, 19-23 January 2009	SGSN Secretary
N049	SGSN Technical Document, Ver.1	2nd SGSN meeting in Nuremberg

Annex 2

SGSN Members List

	Member	Name	Organization
1	Convenor	Yongjin Kim	Modacom Co., Ltd
2	Secretary	Jooran Lee	Korean Standards Association
3	Canada	Wael Badawy	University of Calgary
4	Canada	Abdulkader Barbir	Nortel
5	China	Xing Tao	Shanghai Institute of Micro-system and Information Technology
6	China	Xu Quanping	China Electronics Standardization
7	China	Guo Nan	China Electronics Standardization
8	China	Wang Quan	College of Automation, Chongqing University of Posts and Telecommunications
9	China	Wang Zhongfeng	Shenyang Institute of Automation, Chinese Academy of Sciences
10	China	Long Shaohua	Chongqing University of Posts and Telecommunications
11	China	Tian Hui	Beijing University of Posts and Telecommunications
12	China	Wu Wenquan	Shanghai Research & Development Center of Hangzhou Homewell Intelligence Control Co., Ltd.
13	China	Li Jiandong	Xidian University
14	China	Xiao Yuelei	China IWNCOMM Co., Ltd.
15	China	Pang Liaojun	China IWNCOMM Co., Ltd.
16	France	Valérie Barnole	France Telecom
17	Japan	Yoshito Sakurai	Hitachi, Ltd.
18	Japan	Takashi Kan	Mitsubishi Electric Corporation
19	Japan	Koichi Emura	Panasonic
20	Japan	Munaka Tatsuji	Mitsubishi Electric

21	Korea	Jinseok Bae	KATS
22	Korea	Ho-In Jeon	Kyungwon University
23	Korea	Seung-Ok Lim	Korea Electronics Technology Institute
24	JTC1/SC 6	Yong Woon Kim	Electronics and Telecommunications Research Institute
25	Norway	Asbjorn Hovsto	ITS Norway
26	UK	Kate Grant	
27	UK	Philip Brown	
28	UK	Nigel Rix	Knowledge Transfer Networks
29	JTC 1/SC 31	Craig Harmon	Q.E.D. Systems
30	JTC 1/SC 31	Yuval Kost	Software Solutions Architect SandLinks
31	JTC 1/SC 31	Pankaj Sood	McMaster University
32	ISO/TC 211	Chris Body	Geoscience Australia - Corporate Information Management and Access Division Corporate Data and Web Unit
33	IEC TC 65 IEC SC65C	Bernard Dumortier	Schneider-Electric
34	US	Dr. Timothy Schoechle	Farance, Inc. 3066 6th Street Boulder, Colorado 80304 USA
35	Germany	Dr. Alexander Pflaum	Fraunhofer Centre for Applied Research on Technologies of the Logistics Service Industries
36	Germany	Heinz O. Walker	Siemens
37	JTC 1/SC 36	Howard C. Choe	Raytheon
38	IEC TC 100 (proxy)	Subing Zhang	
39	UK	Robin Tasker	STFC, Daresbury Laboratory
40	UK	John Larmouth	Larmouth T&PDS Ltd
41	Korea	Hyunkook Kahng	Korea University

Annex 3

Resolutions from SGSN meetings

SGSN Resolutions approved at the 1st meeting (26-27 June 2008, Shanghai, China)

JTC 1 SGSN Shanghai Resolution 1

SGSN requests SGSN members to submit contribution to the draft Technical Document to finalize it no later than 10th August 2008 in consideration of ToR of SGSN, which is contained in SGSN N001. Finalization of the Technical Document is expected to be done at the 2nd SGSN meeting.

- Approved

JTC 1 SGSN Shanghai Resolution 2

SGSN appoints Dr. Howard Choe as an editor and Nigel Rix as a co-editor for the Technical Document.

- Approved

JTC 1 SGSN Shanghai Resolution 3

SGSN approves its work plan before the 2008 JTC 1 Plenary meeting as follows:

Dates	Action	Note
1 July – 10 August 2008	Contribution to the Technical Document by SGSN members	NBs and Liaison Organizations contributions based on e-mail discussion
15-19 September 2008	2nd SGSN meeting, at Fraunhofer Center for Applied Research on Technologies of	To finalize the Technical Document and to make its recommendations to JTC 1.

	the Logistics Services Industry in Nuremberg, Germany	
10 October 2008	Contribution for the November 2008 JTC 1 Plenary Meeting	Submission of the SGSN report to the JTC 1 Secretariat
10-15 November 2008	JTC 1 Plenary Meeting in Nara, Japan	SGSN reporting by the Convenor to JTC 1

- Approved

<Acclamation>

JTC 1 SGSN Appreciation to the Meeting Hosts

SGSN expresses its appreciation to the meeting organizer, Standardization Administration of China and the meeting co-organizer, Shanghai Institute of Microsystem and Information Technology for the many efforts to this successful meeting.

Dai Hong	SAC
Feng Songlin	SIMIT
Nie Chunni	Science and Technology Commission of Shanghai Municipality
Nin Ling	CESI

SGSN especially appreciates to Dr. Tao Xing and Ms. Cincy Cui for their brilliant preparation and support before and during the meeting.

- Acclaimed

SGSN Resolutions approved at the 2nd meeting (15-19 September 2008, Nuremberg, Germany)

SGSN Nuremberg Resolution 1

JTC 1 SGSN recognizes the need to refine its Technical Document developed in the last two meetings and so requests JTC1's affirmation to continue its activity until the 2009 JTC1 meeting.

- Approved

SGSN Nuremberg Resolution 2

As JTC 1 SGSN needs more contributions from JTC 1 National Bodies and its Subcommittees for their existing and potential area for standardization on sensor networks, SGSN requests JTC 1 Secretariat to issue a call for contribution to JTC 1 National Bodies and its Subcommittees on SGSN Technical Document.

- Approved

SGSN Nuremberg Resolution 3

JTC 1 SGSN requests its members to submit contribution to the Technical Document to further investigate standardization area of sensor networks for JTC 1 and coordination proposals to JTC 1 no lather than 15th December 2008. These contributions should be considered at the 3rd SGSN meeting in January 2009.

- Approved

SGSN Nuremberg Resolution 4

JTC 1 SGSN approves its future work plan as follows:

Dates	Action	Note
10 October 2008	SGSN Contribution for the 2008 JTC 1 Plenary Meeting	Submission of the SGSN report to the JTC 1 Secretariat
10-15 November 2008	JTC 1 Plenary Meeting (Nara, Japan)	SGSN reporting by the Convenor to JTC 1

15 December 2008	Contributions to TD	By SGSN members
19-23 January 2009	3rd SGSN meeting (Sydney, Australia)	Hosted by NB of Australia, SA (Standards Australia)
29 June – 3 July 2009	4th SGSN meeting (Oslo, Norway)	Hosted by NB of Norway

- Approved

<Acclamation>

SGSN Appreciation to the Meeting Hosts

JTC 1 SGSN expresses its gratitude to Fraunhofer for their warm hospitality and the excellent arrangement of this 2nd JTC 1 SGSN meeting in Nuremberg.

Alexander Pflaum	Fraunhofer, Center for Applied Research on Technologies of the Logistics Services Industry (ATL)
Christina Buske	Fraunhofer, Center for Applied Research on Technologies of the Logistics Services Industry (ATL)
Daniela Rembor	Fraunhofer, Center for Applied Research on Technologies of the Logistics Services Industry (ATL)
Jürgen Hupp	Fraunhofer, Institute for Integrated Circuits (IIS)

- Acclaimed