ISO/IEC JTC 1/WG 7
Working Group on Sensor Networks

Document Number:	N090
Date:	2010-09-06
Replace:	
Document Type:	Working Draft Text
Document Title:	1st Working Draft of ISO/IEC WD 29182-6, Information technology — Sensor Networks: Sensor Network Reference Architecture (SNRA) — Part 6: Application Profiles
Document Source:	Project Editor
Document Status:	As per the JTC 1/WG 7 Gaithersburg recommendation 2, this document is circulated to JTC 1 NBs and WG 7 members for comment.
Action ID:	COM
Due Date:	2010-11-15
No. of Pages:	12

ISO/IEC JTC 1/WG 7 Convenor:
Dr. Yongjin Kim, Modacom Co., Ltd (Email: cap@modacom.co.kr)
ISO/IEC JTC 1/WG 7 Secretariat:
Ms. Jooran Lee, Korean Standards Association (Email: jooran@kisi.or.kr)

ISO/IEC JTC 1/WG 7 N 090

Date: 2010-09-06

ISO/IEC WD 29182-6

ISO/IEC JTC 1/WG 7

Secretariat: KSA

Information technology — Sensor Networks: Sensor Network Reference Architecture (SNRA) — Part 6: Application Profiles

Document type: International standard
Document subtype: if applicable
Document stage: (20) Preparation
Document language: E

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO/IEC 29182-6 was prepared by Working Group ISO/IEC JTC 1/WG 7.

ISO/IEC 29182 consists of the following parts, under the general title *Information technology — Sensor networks: Sensor Network Reference Architecture (SNRA)*:

Part 1: General overview and requirements

Part 2: Vocabulary/Terminology

Part 3: Reference architecture views

Part 4: Entity models

Part 5: Interface definitions

Part 6: Application profiles

Part 7: Interoperability guidelines

Introduction

There have been a number of sensor network applications so far, such as burglar alarming, fire alarming, structural health monitoring, meteorological information gathering, etc. But sensor network applications are being evolved by new technical achievements such as wireless sensor networking, context-based processing, sensor networking solutions standardized globally, open service environment, nationwide integration of various sensor network applications, etc., which means that sensor network applications and services have to be involved with a variety of sophisticated functionalities. Sensor Network Reference Architecture (SNRA) can give an overall understanding of various architecture instances of lots of sensor network applications/services and relationship among relevant functionalities.

Information technology — Sensor Network Reference Architecture (SNRA) – Part 6: Application Profiles

1 Scope

This part of ISO/IEC 29182-6 identifies and defines the functional blocks and components of a generic sensor network system, and the distinct characteristics of each component. It also defines a generic sensor network reference architecture incorporating the relevant sensor network-related base standards to support interoperability and data interchange.

NOTE: The generic sensor network reference architecture will be described in ISO/IEC 29182-3 to 5. Part 6 has to be developed in strong cooperation with these parts.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 29182-1, *Information technology – Sensor Network: Sensor Network Reference Architecture (SNRA) – Part 1: General overview and requirements*

ISO/IEC 29182-2, *Information technology – Sensor Network: Sensor Network Reference Architecture (SNRA) – Part 2: Vocabulary/Terminology*

ISO/IEC 29182-3 *Information technology – Sensor Network: Sensor Network Reference Architecture (SNRA) – Part 3: Reference architecture views*

ISO/IEC 29182-4 *Information technology – Sensor Network: Sensor Network Reference Architecture (SNRA) – Part 4: Entity models*

ISO/IEC 29182-5 *Information technology – Sensor Network: Sensor Network Reference Architecture (SNRA) – Part 5: Interface definitions*

ISO/IEC 29182-7, *Information technology – Sensor Network: Sensor Network Reference Architecture (SNRA) – Part 7: Interoperability guidelines*

ITU-T Recommendation F.744, *Service description and requirements for ubiquitous sensor network middleware (2009)*

ITU-T Recommendation Y.2221, *Requirements for support of Ubiquitous Sensor Network (USN) applications and services in NGN environment (2009)*

3 Terms and Definitions

ISO/IEC 29182-2 delivers terminology and vocabulary which is used within the other parts of the same standards. The following additional terms are needed in order to understand the content of part 6.

3.1
application

a hardware/software system implemented to satisfy a broad set of requirements. In this context, an application incorporates a sensor network system to satisfy a subset of requirements related to the measurement, processing and presentation of environmental conditions as well as to the generation and processing of business events deducted from the measured data. For example a sensor network enabled asset management system has a broad “requirement” to localize a given asset inside a production site so that an employee is able to find the asset without loss of time or to record starting and termination time of usage so that usage costs of the asset can be booked onto the users internal account. The system uses the sensor network to localize the asset and to identify the user at times when the user starts or stops usage of the asset.

3.2
base standard

a fundamental standard with elements that contain options. Base standards can be used in diverse applications, for each of which it may be useful to fix the optional elements in a standardized profile with the aim of achieving interoperability between instances of the specific application

3.3
application profile

conforming subsets or combinations of base standards used to effect specific sensor network functions. Application profiles define specific values or conditions from the range of options described in the relevant base standards, with the aim of supporting the interchange of data between applications and the interoperability of systems.

3.4
sensor network system

TBD

3.5
sensor network system components

those parts or elements of the system that perform specific tasks that are required by the system in order for it to function.

3.6
database

a structured set of data held in a computer

3.7
end-user

a person who interacts with a sensor network system to get his requirements fulfilled

3.8
standard

document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context - Note - Standards should be based on the consolidated results of science, technology and experience, and aimed at the promotion of optimum community benefits

3.9
user

the individual responsible for managing and/or implementing and/or administering the biometric system, as distinct from the end-user whose biometric sample is captured

4 Symbols and abbreviated terms

TBD

5 General sensor network system

5.1 Conceptual diagram of general sensor network system

Given the variety of applications and technologies, it might seem difficult to draw any generalizations about sensor network systems. All such systems, however, have many elements in common. Measurements are acquired by a sensor. The sensor output might be fused with measurements of other sensors and then sent to a database or a processor which evaluates the information using rules which have to be defined by an end-user. The evaluation can result in an event which is then distributed to one or more end-users. In case that it is necessary a user can also request for sensor measurements which are stored in the data base.

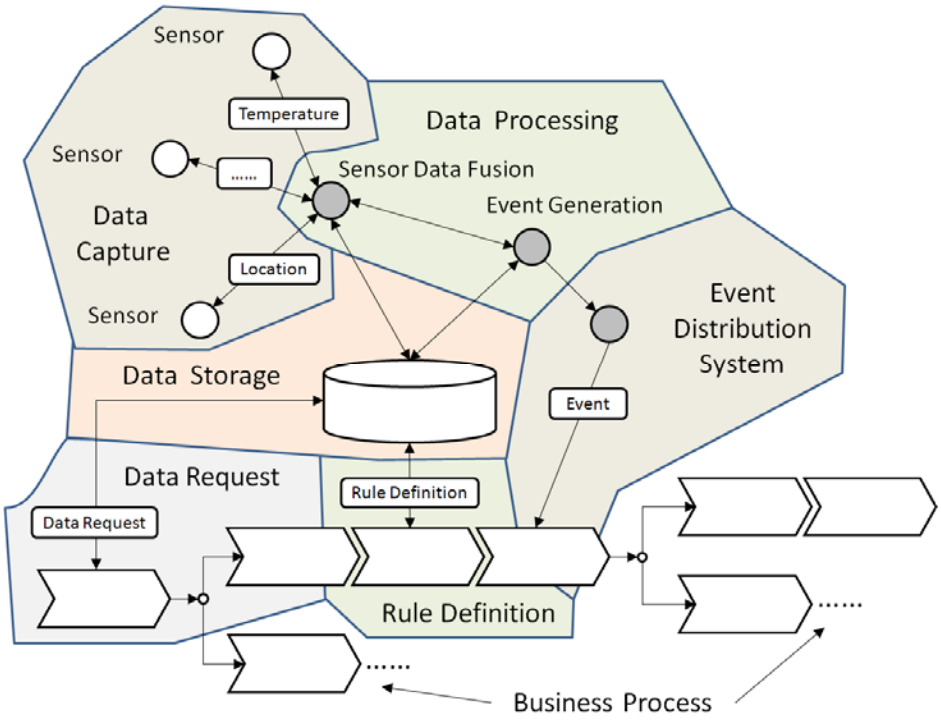

Figure 1: General sensor network system

Figure 1 illustrates the information flows within a general sensor network system, showing a general sensor network system consisting of data capture, data storage, data processing, rule generation event distribution subsystem, data transmission and administration subsystems. The last two are not shown in the picture. The following subclauses describe each of these subsystems in more detail. It should be noted that, in any real sensor network system, these conceptual components may not exist or may not directly correspond to the physical components.

5.2 Conceptual components of a general sensor network system

5.2.1 Data Capture Subsystem

TBD

5.2.2 Data Storage Subsystem

TBD

5.2.3 Data Processing Subsystem

TBD

5.2.4 Rule Generation Subsystem

TBD

5.2.5 Event Distribution Subsystem

TBD

5.2.6 Data Transmission Subsystem (not shown in the figure)

TBD

5.2.7 System Administration Subsystem (not shown in the figure)

TBD

5.3 Functions of general sensor network system

TBD

6 Relationship between the sensor network system and the application

TBD

7 Interfaces between the sensor network system and the application

TBD

8 Developing sensor network profiles utilizing biometrics base standards

TBD

Bibliography

ISO/IEC JTC1 SGSN N149, *SGSN Technical Document Version 3*