

I n t e r n a t i o n a l T e l e c o m m u n i c a t i o n U n i o n

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.641

(02/2012)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Broadband, triple-play and advanced multimedia
services – Ubiquitous sensor network applications and
Internet of Things

SNMP-based sensor network management framework

Recommendation ITU-T H.641



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ITU-T H-SERIES RECOMMENDATIONS
AUDIOVISUAL AND MULTIMEDIA SYSTEMS

CHARACTERISTICS OF VISUAL TELEPHONE SYSTEMS	H.100–H.199
INFRASTRUCTURE OF AUDIOVISUAL SERVICES	
General	H.200–H.219
Transmission multiplexing and synchronization	H.220–H.229
Systems aspects	H.230–H.239
Communication procedures	H.240–H.259
Coding of moving video	H.260–H.279
Related systems aspects	H.280–H.299
Systems and terminal equipment for audiovisual services	H.300–H.349
Directory services architecture for audiovisual and multimedia services	H.350–H.359
Quality of service architecture for audiovisual and multimedia services	H.360–H.369
Supplementary services for multimedia	H.450–H.499
MOBILITY AND COLLABORATION PROCEDURES	
Overview of Mobility and Collaboration, definitions, protocols and procedures	H.500–H.509
Mobility for H-Series multimedia systems and services	H.510–H.519
Mobile multimedia collaboration applications and services	H.520–H.529
Security for mobile multimedia systems and services	H.530–H.539
Security for mobile multimedia collaboration applications and services	H.540–H.549
Mobility interworking procedures	H.550–H.559
Mobile multimedia collaboration inter-working procedures	H.560–H.569
BROADBAND, TRIPLE-PLAY AND ADVANCED MULTIMEDIA SERVICES	
Broadband multimedia services over VDSL	H.610–H.619
Advanced multimedia services and applications	H.620–H.629
Ubiquitous sensor network applications and Internet of Things	H.640–H.649
IPTV MULTIMEDIA SERVICES AND APPLICATIONS FOR IPTV	
General aspects	H.700–H.719
IPTV terminal devices	H.720–H.729
IPTV middleware	H.730–H.739
IPTV application event handling	H.740–H.749
IPTV metadata	H.750–H.759
IPTV multimedia application frameworks	H.760–H.769
IPTV service discovery up to consumption	H.770–H.779

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T H.641

SNMP-based sensor network management framework

Summary

Recommendation ITU-T H.641 describes a sensor network management framework intended to provide integrated management functionalities for heterogeneous sensor networks using the simple network management protocol (SNMP).

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.641	2012-02-13	16

Keywords

Sensor network management framework, SNMP.

FOREWORD

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Table of Contents

		Page
1	Scope	1
2	References.....	1
3	Definitions	1
	3.1 Terms defined elsewhere	1
	3.2 Terms defined in this Recommendation.....	2
4	Abbreviations and acronyms	2
5	Conventions	3
6	Architecture of an SNMP-based sensor network management framework.....	3
7	Functional entities of SNMP-based sensor network management framework.....	3
	7.1 SNMP manager	4
	7.2 SNMP agent.....	4
	7.3 Sensor network management protocol manager.....	4
	7.4 Sensor network management protocol agent.....	4
	7.5 Application level gateway	5
	7.6 Managed object for sensor network	5
	7.7 Managed object for sensor node.....	5
8	Operation of an SNMP-based sensor network management framework.....	5
	8.1 Overview	5
	8.2 Application level gateway database	6
	8.3 Translation from an SNMP to a sensor network management protocol message.....	6
	8.4 Translation from a sensor network management protocol to an SNMP message.....	7
	8.5 Consideration of the sensor network gateway for supporting IP-based sensor networks	8
9	Object identifier allocation for MIB and object identifier translation between SNMP and sensor network management protocols.....	9
	Annex A – Object identifier assignments	10
	Appendix I – Example of object identifier translation.....	11
	Bibliography.....	12

Introduction

Ubiquitous sensor network (USN) is a conceptual network built over existing physical networks that makes use of sensed data and provides knowledge services to anyone, anywhere and at any time, and where the information is generated by using context awareness [ITU-T Y.2221]. One of the basic infrastructures of USN is wireless sensor networks that monitor physical or environmental conditions. These sensor networks may use different MAC/PHY protocols and different transport protocols, they may have different sensor node identification schemes and may use different management protocols.

From the viewpoint of a sensor network management protocol, each sensor network may use different sensor network management protocols that are optimized for its MAC/PHY characteristics, transport layer characteristics and for each sensor network management information base (MIB). For example, an IEEE 802.15.4 based sensor network can deliver a 128 bytes frame at one time including 22 bytes of the IEEE 802.15.4 header. It means that a sensor network management protocol for an IEEE 802.15.4-based sensor network should be designed considering this frame size. The ZigBee sensor network based on IEEE 802.15.4 uses its own addressing scheme and defines its own MIB.

Currently, many new sensor networking technologies are under development and it is inevitable that optimized sensor networking technologies for a particular purpose will be deployed. This means that there will be many heterogeneous sensor networks.

From the viewpoint of network management, managing each heterogeneous sensor network with heterogeneous management protocols is impractical and an integrated management protocol for all heterogeneous sensor networks is needed.

The common management information protocol (CMIP) [ITU-T X.711] is widely used in network management systems. However, most TCP/IP devices only support SNMP. SNMP is favoured and strongly supported by vendors, and it has been successfully adapted to manage wired and wireless networks.

Due to the limited computing and communication power of sensor networks, the use of standard SNMP in sensor networks is either impractical or impossible.