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Information technology — Radio frequency identification (RFID) for item management — Software system infrastructure —

Part 3: Device management

Technologies de l'information — Identification de radiofréquence (RFID) pour la gestion d'élément — Infrastructure de systèmes logiciels —

Partie 3: Gestion de dispositif

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 24791-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

ISO/IEC 24791 consists of the following parts, under the general title *Information technology — Radio frequency identification (RFID) for item management — Software system infrastructure*:

— *Part 1: Architecture*

— *Part 2: Data management*

— *Part 3: Device management*

— *Part 5: Device interface*

Introduction

RFID air interface technology is based on non-contact electro-magnetic communication among interrogators and tags. RFID software systems are composed of RFID interrogators, intermediate software systems, and applications that provide control and coordination of air interface operation, tag information exchange, and health and performance management of system components. RFID technology is expected to increase effectiveness in many aspects of business by further advancing the capabilities of Automatic Identification and Data Capture (AIDC). To achieve this goal through the successful adoption of RFID technology into real business environments, RFID devices, software systems, and business applications must provide secure and interoperable services, interfaces, and technologies. This is the goal of the standards defined for RFID Software System Infrastructure (SSI), ISO/IEC 24791.

Information technology — Radio frequency identification (RFID) for item management — Software system infrastructure —

Part 3: Device management

1 Scope

This part of ISO/IEC 24791 defines interfaces for device management of RFID systems. Interfaces are defined that provide for discovery, configuration, initialization and monitoring of RFID systems within the Software System Infrastructure (SSI).

This standard only deals with devices that provide RFID related services. It does not distinguish the form factor of such RFID devices.

This part of ISO/IEC 24791 provides two distinct *interface sets*, one based on the EPCglobal Discovery, Configuration, and Initialization (DCI) standard and the IETF SNMP RFCs and the other based on the Organization for the Advancement of Structured Information Standards (OASIS) Device Profile for Web Services (DPWS) standard. The definition of the Device Profile for RFID will be referred to in this part as the RFID Device Management Profile, or RDMP.

Each interface option set provides interface definitions that provide ISO/IEC 24791-3 Client Endpoints and Services Endpoints with the mechanisms for:

- discovery of the RFID devices and services on a local or remote subnet
- a firmware upgrade service
- a management service that implements configuration related functions
- a monitoring service for reporting alerts, diagnostics, and performance information.

The two interface set definitions provided by this part of ISO/IEC 24791 allow for clients and services endpoints to implement and provide the services based on the specific characteristics of the RFID system to be implemented. Clause 2 defines the Conformance requirements for systems that implement components of one or both of the interface sets.

2 Conformance

This part of ISO/IEC 24791 provides two interface sets; the DCI and SNMP Interface Set and the RDMP interface Set. If a certain implementation conforms to the mandatory functions of at least one of the interface sets, that implementation is conformant to this part of ISO/IEC 24791.

2.1 DCI and SNMP Interface Set

This version of this International Standard divides the DCI capabilities into two *Conformance Groups:*

- Discovery, Configuration, and Initialization Conformance Group

This Conformance Group is defined in Clause 8.2.1. It specifies the protocols and operational procedures that are required for conforming Interrogator Implementations and Device Management Implementations, as defined in this part of ISO/IEC 24791 as well as in ISO/IEC 24791-1.

- Performance Monitoring and Diagnostics Conformance Group

  This Conformance Group is defined in Clause 8.2.2. It specifies the SNMP MIBs that may be implemented by Interrogator Implementations and Data Management Implementations as defined in this part of ISO/IEC 24791 as well as in ISO/IEC 24791-1. Conforming implementations claim conformance to the MODULE_COMPLIANCE statements in the SNMP MIBs appropriate for the particular implementation.

A conforming implementation must implement all of the requirements of each Conformance Group for its particular function in the SSI, but an implementation is not required to claim conformance to either group.

2.2 RDMP Interface Set

This version of the International standard specifies the following device management capabilities in RDMP

- Discovery of devices and hosted services in devices
- A Firmware Upgrade Service to initialize and manage firmware on devices
- A Management service to set and get device configuration and to perform specific device operations, such as reboot
- A monitoring service to monitor the health of a device using events and statistics

A conforming RDMP implementation shall implement DEVICE as defined in DPWS

A conforming RDMP implementation may implement the firmware update service (FUS). If it does implement FUS, it shall implement the mandatory requirements of the firmware update service

A conforming RDMP implementation may implement the management service (MS). If it does implement MS, it shall implement the mandatory requirements of the management service.

A conforming RDMP implementation may implement the monitoring service (MNS). If it does implement MNS, it shall implement the mandatory requirements of the monitoring service.

3 Normative references

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

ISO/IEC 19762-1, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 1: General terms relating to AIDC*

ISO/IEC 19762-3, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 3: Radio frequency identification (RFID)*

ISO/IEC 24791-5, *Information technology — Radio frequency identification (RFID) for item management — Software system infrastructure — Part 5: Device interface*

Devices Profile for Web Services Version 1.1, OASIS Standard July 2009- http://docs.oasis-open.org/ws-dd/dpws/1.1/os/wsdd-dpws-1.1-spec-os.pdf.

Control and Provisioning of Wireless Access Points - Protocol Specification - http://www.rfc-editor.org/rfc/rfc5415.txt

EPCglobal, Reader Management Standard, http://www.epcglobalinc.org/standards/rm.

EPCglobal, Discovery, Configuration, & Initialisation Standard for Reader Operations, http://www.epcglobalinc.org/standards/dci.

Internet Engineering Task Force, RFC3418 - Simple Network Management Protocol (SNMP), http://www.faqs.org/rfcs/rfc3418.html

Internet Engineering Task Force, RFC 2011 – SNMPv2 Management Information Base for the Internet Protocol using SMIv2, http://www.faqs.org/rfcs/rfc2011.html

Internet Engineering Task Force, RFC 2863 – The Interfaces Group MIB, http://www.faqs.org/rfcs/rfc2863.html

XML Schema Part 2: Datatypes: http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762-1, ISO/IEC 19762-3, and the following apply.

4.1
Component
identifiable part of a larger program that provides specific functionality

4.2
Device
RFID Interrogator implementation

4.3
Interface
functions or mechanisms that provide communications to or from a component

4.4
Data management
device functionality that includes or is a combination of reading, writing, collection, filtering, grouping, and event subscription and notification of RFID tag data to higher level applications and interfaces

4.5
Device management
functionality that includes or is a combination of monitoring and control of discovery, configuration, performance and diagnosis of one or more RFID interrogators

4.6
Endpoint
component that implements or exposes an interface to other components or uses the interface of another component

4.7
Implementation
software and hardware that provides the reduction to practice of particular functionality