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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
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The Consultative Committee for Space Data Systems

Recommendation for Space Data System Practices

SPACECRAFT ONBOARD INTERFACE SERVICES—DEVICE ENUMERATION SERVICE

RECOMMENDED PRACTICE

CCSDS 871.3-M-1

MAGENTA BOOK

October 2014

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This document has been approved for publication by the Management Council of the Consultative Committee for Space Data Systems (CCSDS) and represents the consensus technical agreement of the participating CCSDS Member Agencies. The procedure for review and authorization of CCSDS documents is detailed in *Organization and Processes for the Consultative Committee for Space Data Systems* (CCSDS A02.1-Y-4), and the record of Agency participation in the authorization of this document can be obtained from the CCSDS Secretariat at the e-mail address below.

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CCSDS Secretariat
National Aeronautics and Space Administration
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E-mail: secretariat@mailman.ccsds.org

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FOREWORD

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1 INTRODUCTION

1.1 PURPOSE AND SCOPE OF THIS DOCUMENT

This document is one of a family of documents specifying the Spacecraft Onboard Interface Services (SOIS)-compliant service to be provided in support of applications.

The purpose of this document is to define services and service interfaces provided by the SOIS Device Enumeration Service (DES). Its scope is to specify the service only and not to specify methods of providing the service, although use of the SOIS subnetwork services is assumed.

This document conforms to the principles set out in the SOIS Green Book (reference [D3]) and is intended to be applied together with it.

1.2 APPLICABILITY

This document applies to any mission or equipment claiming to provide a SOIS-compatible DES.

1.3 RATIONALE

SOIS provide service interface specifications in order to promote commonality of functionality amongst systems implementing well-defined services. These interfaces do not dictate implementation of interfaces or protocols supporting the services.

1.4 DOCUMENT STRUCTURE

This document comprises three sections:

- this section, containing administrative information, definitions, and references;
- section 2 containing general concepts and assumptions;
- section 3 containing the DES specification.

In addition, one normative and three informative annexes are provided:

- annex A, comprising a Protocol Implementation Conformance Proforma;
- annex B, discussing security considerations relating to the specifications of this document;
- annex C, containing a list of acronyms;
- annex D containing a list of informative references.

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1.5 DEFINITIONS

1.5.1 GENERAL

For the purpose of this document the following definitions apply.

1.5.2 DEFINITIONS FROM THE OPEN SYSTEMS INTERCONNECTION (OSI) BASIC REFERENCE MODEL

This document is defined using the style established by the Open Systems Interconnection (OSI) Basic Reference Model (reference [D2]). This model provides a common framework for the development of standards in the field of systems interconnection.

The following terms used in this Recommended Practice are adapted from definitions given in reference [D2]:

layer: A subdivision of the architecture, constituted by subsystems of the same rank.

service: A capability of a layer, and the layers beneath it (a service provider), which is provided to the service-users at the boundary between the service-providers and the service-users.

1.5.3 TERMS DEFINED IN THIS RECOMMENDED PRACTICE

For the purposes of this Recommended Practice, the following definitions also apply.

application: Any component of the onboard software that makes use of the DES. This includes flight software applications and higher-layer services.

device: A real hardware component of the spacecraft, such as a sensor or actuator, or a single register within such a component.

notification: A service interface provided by applications that is invoked by a service implementation to provide a means for the service implementation to deliver a message to a set of applications.

1.6 NOMENCLATURE

1.6.1 NORMATIVE TEXT

The following conventions apply for the normative specifications in this Recommended Practice:

a) the words ‘shall’ and ‘must’ imply a binding and verifiable specification;

b) the word ‘should’ implies an optional, but desirable, specification;

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c) the word ‘may’ implies an optional specification;

d) the words ‘is’, ‘are’, and ‘will’ imply statements of fact.

NOTE – These conventions do not imply constraints on diction in text that is clearly informative in nature.

1.6.2 INFORMATIVE TEXT

In the normative sections of this document, informative text is set off from the normative specifications either in notes or under one of the following subsection headings:

– Overview;

– Background;

– Rationale;

– Discussion.

1.7 REFERENCES

The following publications contain provisions which, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All publications are subject to revision, and users of this document are encouraged to investigate the possibility of applying the most recent editions of the publications indicated below. The CCSDS Secretariat maintains a register of currently valid CCSDS publications.

[1] *Spacecraft Onboard Interface Services—Device Access Service*. Issue 1. Recommendation for Space Data System Practices (Magenta Book), CCSDS 871.0-M-1. Washington, D.C.: CCSDS, March 2013.

[2] *Spacecraft Onboard Interface Services—Device Virtualization Service*. Issue 1. Recommendation for Space Data System Practices (Magenta Book), CCSDS 871.2-M-1. Washington, D.C.: CCSDS, March 2014.

[3] *Spacecraft Onboard Interface Services—Subnetwork Device Discovery Service*. Issue 1. Recommendation for Space Data System Practices (Magenta Book), CCSDS 854.0-M-1. Washington, D.C.: CCSDS, December 2009.

[4] *Spacecraft Onboard Interface Services—Subnetwork Memory Access Service*. Issue 1. Recommendation for Space Data System Practices (Magenta Book), CCSDS 852.0-M-1. Washington, D.C.: CCSDS, December 2009.

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