INTERNATIONAL STANDARD

ISO
18440

First edition
2013-06-01

Space data and information transfer systems — Space Link Extension — Internet Protocol for Transfer Services

Systèmes de transfert des informations et données spatiales — Extension de liaisons spatiales — Protocole Internet pour services de transfert

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 18440:2013
https://standards.iteh.ai/catalog/standards/sist/49f75cd0-4c45-426c-9017-
55f35b0978f3/iso-18440-2013

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 18440:2013
https://standards.iteh.ai/catalog/standards/sist/49f75cd0-4c45-426c-9017-
55f35b0978f3/iso-18440-2013

COPYRIGHT PROTECTED DOCUMENT

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

ISO 18440 was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 913.1-B-1, September 2008) and was adopted (without modifications except those stated in Clause 2 of this International Standard) by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 13, *Space data and information transfer systems*.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Space data and information transfer systems — Space Link Extension — Internet Protocol for Transfer Services

1   Scope

The Space Link Extension (SLE) Reference Model identifies a set of SLE Transfer Services that enable missions to send forward space link data units to a spacecraft and to receive return space link data units from a spacecraft. A subset of these services is specified by the SLE Transfer Service Recommended Standards. The SLE Transfer Service Recommended Standards specify:

   a)   the operations necessary to provide the transfer service;

   b)   the parameter data associated with each operation;

   c)   the behaviors that result from the invocation of each operation; and

   d)   the relationship between, and the valid sequence of, the operations and resulting behaviors.

However, they deliberately do not specify the methods or technologies required for communications.

The purpose of this International Standard is to define a protocol for transfer of SLE Protocol Data Units (PDUs) defined in the SLE Transfer Service Recommended Standards using the Internet protocols TCP (Transmission Control Protocol and IP (Internet Protocol) for data transfer and the Abstract Syntax Notation One (ASN.1) for data encoding. This protocol is referred to as the Internet SLE Protocol One (ISP1).

This International Standard defines a protocol for transfer of SLE PDUs between an SLE user and an SLE provider system in terms of:

   a)   the procedures used to establish and release associations;

   b)   the messages exchanged on an established association;

   c)   the procedures used to monitor the status of data communication connections; and

   d)   the methods used to ensure that data are converted between different formats and representations on different platforms.

It does not specify:

   a)   individual designs, implementations, or products;

   b)   the configuration of the data communications infrastructure, including configuration of the TCP and IP protocols;

   c)   the means by which addresses (IP addresses and TCP port numbers) are agreed, assigned, and communicated.

This International Standard responds to the requirements imposed by the International Standards for SLE transfer services that were available when this International Standard was released. The protocol specified in this International Standard conforms to the requirements on data communication services set forth in those International Standards.

The scope and field of application are furthermore detailed in subclause 1.3 of the enclosed CCSDS publication.

2 Requirements

Requirements are the technical recommendations made in the following publication (reproduced on the following pages), which is adopted as an International Standard:

CCSDS 913.1-B-1, September 2008, Space·Link·Extension·---·Internet·Protocol·for·Transfer·Services.

For the purposes of international standardization, the modifications outlined below shall apply to the specific clauses and paragraphs of publication CCSDS 913.1-B-1.

Pages i to v

This part is information which is relevant to the CCSDS publication only.

Page 1-7 and 1-8

Add the following information to the reference indicated:

[1]   Document CCSDS 910.4-B-2, October 2005, is equivalent to ISO 15396:2007.

[2]   Document CCSDS 911.1-B-2, December 2004, is equivalent to ISO 22669:2007.

[3]   Document CCSDS 911.2-B-1, December 2004, is equivalent to ISO 22670:2006.

[4]   Document CCSDS 911.5-B-1, December 2004, is equivalent to ISO 26143:2007.

[5]   Document CCSDS 912.1-B-2, December 2004, is equivalent to ISO 22671:2011.

[6]   Document CCSDS 912.3-B-1, December 2004, is equivalent to ISO 22672:2011.

[13]   Document CCSDS 301.0-B-3, January 2002, is equivalent to ISO 11104:2011.

3 Revision of publication CCSDS 913.1-B-1

It has been agreed with the Consultative Committee for Space Data Systems that Subcommittee ISO/TC 20/SC 13 will be consulted in the event of any revision or amendment of publication CCSDS 913.1-B-1. To this end, NASA will act as a liaison body between CCSDS and ISO.

CCSDS

The Consultative Committee for Space Data Systems

Recommendation for Space Data System Standards

SPACE LINK EXTENSION— INTERNET PROTOCOL FOR TRANSFER SERVICES

RECOMMENDED STANDARD

CCSDS 913.1-B-1

BLUE BOOK
September 2008

AUTHORITY

Issue:	Recommended Standard, Issue 1
Date:	September 2008
Location:	Washington, DC, USA

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 Recommendations is detailed in the *Procedures Manual for the Consultative Committee for Space Data Systems*, and the record of Agency participation in the authorization of this document can be obtained from the CCSDS Secretariat at the address below.

This document is published and maintained by:

iTeh STANDARD PREVIEW
(standards.iteh.ai)

CCSDS Secretariat
Space Communications and Navigation Office, 7L70
Space Operations Mission Directorate
NASA Headquarters
Washington, DC 20546-0001, USA

ISO 18440:2013
https://standards.iteh.ai/catalog/standards/sist/49f75cd0-4c45-426c-9017-
0025b6b5ab3/iso-18440-2013

STATEMENT OF INTENT

The Consultative Committee for Space Data Systems (CCSDS) is an organization officially established by the management of its members. The Committee meets periodically to address data systems problems that are common to all participants, and to formulate sound technical solutions to these problems. Inasmuch as participation in the CCSDS is completely voluntary, the results of Committee actions are termed **Recommended Standards** and are not considered binding on any Agency.

This **Recommended Standard** is issued by, and represents the consensus of, the CCSDS members. Endorsement of this **Recommendation** is entirely voluntary. Endorsement, however, indicates the following understandings:

o   Whenever a member establishes a CCSDS-related **standard**, this **standard** will be in accord with the relevant **Recommended Standard**. Establishing such a **standard** does not preclude other provisions which a member may develop.

o   Whenever a member establishes a CCSDS-related **standard**, that member will provide other CCSDS members with the following information:

   --   The **standard** itself.

   --   The anticipated date of initial operational capability.

   --   The anticipated duration of operational service.

o   Specific service arrangements shall be made via memoranda of agreement. Neither this **Recommended Standard** nor any ensuing **standard** is a substitute for a memorandum of agreement.

No later than five years from its date of issuance, this **Recommended Standard** will be reviewed by the CCSDS to determine whether it should: (1) remain in effect without change; (2) be changed to reflect the impact of new technologies, new requirements, or new directions; or (3) be retired or canceled.

In those instances when a new version of a **Recommended Standard** is issued, existing CCSDS-related member standards and implementations are not negated or deemed to be non-CCSDS compatible. It is the responsibility of each member to determine when such standards or implementations are to be modified. Each member is, however, strongly encouraged to direct planning for its new standards and implementations towards the later version of the Recommended Standard.

5

FOREWORD

Through the process of normal evolution, it is expected that expansion, deletion, or modification of this document may occur. This Recommended Standard is therefore subject to CCSDS document management and change control procedures, which are defined in the *Procedures Manual for the Consultative Committee for Space Data Systems*. Current versions of CCSDS documents are maintained at the CCSDS Web site:

http://www.ccsds.org/

Questions relating to the contents or status of this document should be addressed to the CCSDS Secretariat at the address indicated on page i.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 18440:2013
https://standards.iteh.ai/catalog/standards/sist/49f75cd0-4c45-426c-9017-
55f35b0978f3/iso-18440-2013

At time of publication, the active Member and Observer Agencies of the CCSDS were:

Member Agencies

– Agenzia Spaziale Italiana (ASI)/Italy.
– British National Space Centre (BNSC)/United Kingdom.
– Canadian Space Agency (CSA)/Canada.
– Centre National d'Etudes Spatiales (CNES)/France.
– China National Space Administration (CNSA)/People's Republic of China.
– Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)/Germany.
– European Space Agency (ESA)/Europe.
– Federal Space Agency (FSA)/Russian Federation.
– Instituto Nacional de Pesquisas Espaciais (INPE)/Brazil.
– Japan Aerospace Exploration Agency (JAXA)/Japan.
– National Aeronautics and Space Administration (NASA)/USA.

Observer Agencies

– Austrian Space Agency (ASA)/Austria.
– Belgian Federal Science Policy Office (BFSPO)/Belgium.
– Central Research Institute of Machine Building (TsNIIMash)/Russian Federation.
– Centro Tecnico Aeroespacial (CTA)/Brazil.
– Chinese Academy of Sciences (CAS)/China.
– Chinese Academy of Space Technology (CAST)/China.
– Commonwealth Scientific and Industrial Research Organization (CSIRO)/Australia.
– Danish National Space Center (DNSC)/Denmark.
– European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)/Europe.
– European Telecommunications Satellite Organization (EUTELSAT)/Europe.
– Hellenic National Space Committee (HNSC)/Greece.
– Indian Space Research Organization (ISRO)/India.
– Institute of Space Research (IKI)/Russian Federation.
– KFKI Research Institute for Particle & Nuclear Physics (KFKI)/Hungary.
– Korea Aerospace Research Institute (KARI)/Korea.
– MIKOMTEK: CSIR (CSIR)/Republic of South Africa.
– Ministry of Communications (MOC)/Israel.
– National Institute of Information and Communications Technology (NICT)/Japan.
– National Oceanic and Atmospheric Administration (NOAA)/USA.
– National Space Organization (NSPO)/Chinese Taipei.
– Naval Center for Space Technology (NCST)/USA.
– Space and Upper Atmosphere Research Commission (SUPARCO)/Pakistan.
– Swedish Space Corporation (SSC)/Sweden.
– United States Geological Survey (USGS)/USA.

7

SPACE LINK EXTENSION—INTERNET PROTOCOL FOR TRANSFER SERVICES

DOCUMENT CONTROL

Document	Title	Date	Status
CCSDS 913.1-B-1	Space Link Extension—Internet Protocol for Transfer Services, Recommended Standard, Issue 1	September 2008	Original issue

iTeh STANDARD PREVIEW
(standards.iteh.ai)

CONTENTS

9

CONTENTS (continued)

1 INTRODUCTION

1.1 PURPOSE

The Space Link Extension (SLE) Reference Model (reference [1]) identifies a set of SLE Transfer Services that enable missions to send forward space link data units to a spacecraft and to receive return space link data units from a spacecraft. A subset of these services is specified by the SLE Transfer Service Recommended Standards (references [2], [3], [4], [5], and [6]). The SLE Transfer Service Recommended Standards specify

  a) the operations necessary to provide the transfer service;

  b) the parameter data associated with each operation;

  c) the behaviors that result from the invocation of each operation; and

  d) the relationship between, and the valid sequence of, the operations and resulting behaviors.

However, they deliberately do not specify the methods or technologies required for communications.

The purpose of this Recommended Standard is to define a protocol for transfer of SLE Protocol Data Units (PDUs) defined in the SLE Transfer Service Recommended Standards using the Internet protocols TCP (Transmission Control Protocol, reference [7]) and IP (Internet Protocol, reference [8]) for data transfer and the Abstract Syntax Notation One (ASN.1, references [9] and [10]) for data encoding. This protocol is referred to as the Internet SLE Protocol One (ISP1).

1.2 SCOPE

This Recommended Standard defines a protocol for transfer of SLE PDUs between an SLE user and an SLE provider system in terms of:

  a) the procedures used to establish and release associations;

  b) the messages exchanged on an established association;

  c) the procedures used to monitor the status of data communication connections; and

  d) the methods used to ensure that data are converted between different formats and representations on different platforms.

It does not specify:

  a) individual designs, implementations, or products;

  b) the configuration of the data communications infrastructure, including configuration of the TCP and IP protocols;