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Information technology — Remote Operations: OSI realizations — Remote Operations Service Element (ROSE) protocol specification

Technologies de l'information — Opérations à distance: Réalisations OSI — Spécification du protocole pour l'élément de service des opérations à distance (ROSE)

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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. 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.

International Standard ISO/IEC 13712-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 21, *Open Systems Interconnection, data management and open distributed processing*, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation X.882.

This part of ISO/IEC 13712 is a partial revision of ISO/IEC 9072-2:1989.

ISO/IEC 13712 consists of the following parts, under the general title *Information technology — Remote operations*:

— *Part 1: Concepts, model and notation*

— *Part 2: OSI realizations — Remote Operations Service Element (ROSE) service definition*

— *Part 3: OSI realizations — Remote Operations Service Element (ROSE) protocol specification*

Annexes A and B form an integral part of this part of ISO/IEC 13712. Annexes C and D are for information only.

Introduction

Remote operations (ROS) is a paradigm for interactive communication between objects. As such it can be used in the design and specification of distributed applications. The basic interaction involved is the invocation of an operation by one object (the invoker), its performance by another (the performer), possibly followed by a report of the outcome of the operation being returned to the invoker.

The concepts of ROS, as specified in ITU-T Rec. X.880 I ISO/IEC 13712-1, are abstract, and may be realized in many ways. For example, objects whose interactions employ ROS concepts may be separated by a software interface or by an OSI network.

ITU-T Rec. X.881 I ISO/IEC 13712-2 provides the framework for the realization of an association contract as an OSI application context. Such an application context is specified primarily in terms of a collection of application service elements. From a ROS perspective, these ASEs fall into three broad categories:

    a) operation-specific ASEs, which embody knowledge of the definitions of the operations in the contract;

    b) the Remote Operations ASE (ROSE) which drives the general-purpose protocol required to invoke and report returns of arbitrary operations;

    c) information transfer ASEs concerned with the establishment and release of associations where necessary, and the communication of the ROSE protocol information.

This Recommendation I International Standard describes the behaviour of ROSE itself, and the way in which different collections of information transfer ASEs (specifically, the Reliable Transfer Service Element (RTSE) and the Association Control Service Element (ACSE)) are employed to transfer its protocol control information (PCI) in an OSI realization.

This Recommendation I International Standard is a revision of CCITT Rec. X.229 I ISO/IEC 9072-2. The existing usage of ROSE in conjunction with ACSE, RTSE and the Presentation layer as defined in CCITT Rec. X.229 I ISO/IEC 9072-2 remains valid after this revision. In addition, this revision makes no change to the ROSE PCI.

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – REMOTE OPERATIONS: OSI REALIZATIONS – REMOTE OPERATIONS SERVICE ELEMENT (ROSE) PROTOCOL SPECIFICATION

1   Scope

This Recommendation I International Standard specifies the protocol (abstract syntax) and procedures for the Remote Operation Service Element. The terms, definitions and mechanisms defined in ITU-T Rec. X.880 I ISO/IEC 13712-1 apply here and are specialized for an OSI realization as specified in this Recommendation I International Standard. The ROSE services, defined in ITU-T Rec. X.881 I ISO/IEC 13712-2, are provided in conjunction with the Association Control Service Element (ACSE) services (ITU-T Rec. X.217 I ISO 8649) and the ACSE protocol (ITU-T Rec. X.227 I ISO 8650), optionally the Reliable Transfer Service Element (RTSE) services (ITU-T Rec. X.218 I ISO/IEC 9066-1) and the RTSE protocol (ITU-T Rec. X.228 I ISO/IEC 9066-2), and the Presentation service (ITU-T Rec. X.216 I ISO/IEC 8822).

The ROSE procedures are defined in terms of:

a)   the interactions between peer ROSE protocol machines through the use of RTSE services or the Presentation service;

b)   the interactions between the ROSE protocol machine and its service-user.

This Recommendation I International Standard specifies conformance requirements for systems implementing these procedures.

2   Normative references

The following ITU-T Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Specification. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Specification are encouraged to investigate the possibility of applying the most recent editions of the Recommendations and Standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunications Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1   Identical Recommendations I International Standards

–   ITU-T Recommendation X.200 (1994) I ISO/IEC 7498-1:1994, *Information technology — Open Systems Interconnection — Basic Reference Model: The Basic Model.*

–   ITU-T Recommendation X.210 (1993) I ISO/IEC 10731:1994, *Information technology — Open Systems Interconnection — Basic Reference Model — Conventions for the definitions of OSI services.*

–   ITU-T Recommendation X.215 (1994) I ISO 8326:—[1], *Information processing systems — Open Systems Interconnection — Basic connection oriented session service definition.*

–   ITU-T Recommendation X.216 (1994) I ISO/IEC 8822:1994, *Information technology — Open Systems Interconnection — Presentation service definition.*

–   ITU-T Recommendation X.217 (1995) I ISO 8649:—[2], *Information processing systems — Open Systems Interconnection — Service definition for the Association Control Service Element.*

–   ITU-T Recommendation X.227 (1995) I ISO 8650:—[3], *Information processing systems — Open Systems Interconnection — Protocol specification for the Association Control Service Element.*

–   ITU-T Recommendation X.680 (1994) I ISO/IEC 8824-1:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*

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1)   To be published. (Revision of ISO 8326:1987)
2)   To be published. (Revision of ISO 8649:1988)
3)   To be published. (Revision of ISO 8650:1988)

–   ITU-T Recommendation X.681 (1994) I ISO/IEC 8824-2:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification.*

–   ITU-T Recommendation X.682 (1994) I ISO/IEC 8824-3:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification.*

–   ITU-T Recommendation X.683 (1994) I ISO/IEC 8824-4:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Parametrization of ASN.1 specifications.*

–   ITU-T Recommendation X.690 (1994) I ISO/IEC 8825-1:1995, *Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER).*

–   ITU-T Recommendation X.880 (1994) I ISO/IEC 13712-1:1995, *Information technology – Remote Operations: Concepts, model and notation.*

–   ITU-T Recommendation X.881 (1994) I ISO/IEC 13712-2:1995, *Information technology – Remote Operations: OSI realizations – Remote Operations Service Element (ROSE) service definition.*

2.2   Paired Recommendations I International Standards equivalent in technical content

–   ITU-T Recommendation X.218 (1993), *Reliable transfer: Model and service definition.*

ISO/IEC 9066-1:1989, *Information processing systems – Text communication – Reliable transfer – Part 1: Model and service definition.*

–   ITU-T Recommendation X.228 (1988), *Reliable transfer: Protocol specification.*

ISO/IEC 9066-2:1989, *Information processing systems – Text communication – Reliable transfer – Part 2: Protocol specification.*

–   CCITT Recommendation X.219 (1988), *Remote operations: Model, notation and service definition.*

ISO/IEC 9072-1:1989, *Information processing systems – Text communication – Remote operations – Part 1: Model, notation and service definition.*

–   CCITT Recommendation X.229 (1988), *Remote operations: Protocol specification.*

ISO/IEC 9072-2:1989, *Information processing systems – Text communication – Remote operations – Part 2: Protocol specification.*

2.3   Additional references

–   CCITT Recommendation X.410 (1984), *Message handling systems: Remote operations and reliable transfer service*