



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 62264-6:2020**

**01-december-2020**

---

**Integracija sistemov za upravljanje podjetij - 6. del: Model storitve sporočanja**

Enterprise-control system integration - Part 6: Messaging service model

Integration von Unternehmensführungs- und Leitsystemen - Teil 6: Dienstmodell zur Nachrichtenübermittlung

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

**Ta slovenski standard je istoveten z: prEN IEC 62264-6**

[oSIST prEN IEC 62264-6:2020](https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-aec9-db5487a1585f/osist-pren-iec-62264-6-2020)

<https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-aec9-db5487a1585f/osist-pren-iec-62264-6-2020>

---

**ICS:**

03.100.01	Organizacija in vodenje podjetja na splošno	Company organization and management in general
25.040.01	Sistemi za avtomatizacijo v industriji na splošno	Industrial automation systems in general
35.240.50	Uporabniške rešitve IT v industriji	IT applications in industry

**oSIST prEN IEC 62264-6:2020**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[oSIST prEN IEC 62264-6:2020](https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-aec9-db5487a1585f/osist-pren-iec-62264-6-2020)

<https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-aec9-db5487a1585f/osist-pren-iec-62264-6-2020>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN IEC 62264-6**

October 2020

---

ICS 25.040.40; 35.100.70

English Version

**Enterprise-control system integration - Part 6: Messaging service  
model  
(IEC 62264-6:2020)**

To be completed  
(IEC 62264-6:2020)

Integration von Unternehmensführungs- und Leitsystemen -  
Teil 6: Dienstmodell zur Nachrichtenübermittlung  
(IEC 62264-6:2020)

This draft European Standard is submitted to CENELEC members for enquiry.  
Deadline for CENELEC: 2020-12-25.

The text of this draft consists of the text of IEC 62264-6:2020 (65E/706/FDIS).

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).  
A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**prEN IEC 62264-6:2020 (E)****European foreword**

This document (prEN IEC 62264-6:2020) consists of the text of IEC 62264-6:2020 prepared by IEC/SC 65E: "Devices and integration in enterprise systems", of IEC technical committee TC65: "Industrial-process measurement, control and automation".

This document is currently submitted to the Enquiry.

The following dates are proposed:

- latest date by which the existence of this document has to be announced at national level (doa) dor + 6 months
- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) dor + 12 months
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) dor + 36 months (to be confirmed or modified when voting)

## **iTeh STANDARD PREVIEW** **(standards.iteh.ai)**

[oSIST prEN IEC 62264-6:2020](https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-aec9-db5487a1585f/osist-pren-iec-62264-6-2020)

<https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-aec9-db5487a1585f/osist-pren-iec-62264-6-2020>

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62264-1	-	Enterprise-control system integration - Part 1: Models and terminology	EN 62264-1	-
IEC 62264-2	-	Enterprise-control system integration - Part 2: Object and attributes for enterprise-control system integration	EN 62264-2	-
IEC 62264-4	-	Enterprise-control system integration - Part 4: Objects, models, attributes for manufacturing operations management integration	EN 62264-4	-
IEC 62264-5	-	Enterprise-control system integration - Part 5: Business to manufacturing transactions	EN 62264-5	-

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[oSIST prEN IEC 62264-6:2020](https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-aec9-db5487a1585f/osist-pren-iec-62264-6-2020)

<https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-aec9-db5487a1585f/osist-pren-iec-62264-6-2020>



IEC 62264-6

Edition 1.0 2020-06

# INTERNATIONAL STANDARD



Enterprise-control system integration –  
Part 6: Messaging service model

**STANDARD PREVIEW**  
(standards.iteh.ai)

[oSIST prEN IEC 62264-6:2020](https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-acc9-db5487a1585f/osist-pren-iec-62264-6-2020)

<https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-acc9-db5487a1585f/osist-pren-iec-62264-6-2020>

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 25.040.40; 35.100.70

ISBN 978-2-8322-8453-7

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	11
2 Normative references .....	11
3 Terms, definitions, abbreviation, and conventions.....	11
3.1 Terms and definitions.....	11
3.2 Abbreviations.....	12
3.3 Conventions.....	13
4 Overview of the MSM .....	13
4.1 Positioning of the MSM .....	13
4.2 Abstract service model.....	14
4.3 Transaction models supported .....	14
4.4 Application roles .....	15
4.5 MSM channels .....	15
4.6 MSM channel services .....	16
4.6.1 Types of channel services .....	16
4.6.2 Channel management services .....	16
4.6.3 Publication channel services.....	16
4.6.4 Request channel services.....	17
4.7 Notify listener service.....	17
5 Methods of operation of channels .....	18
5.1 Channel and topic identification.....	18
5.2 Channel names and hierarchy.....	18
5.2.1 Channel names.....	18
5.2.2 Channel name hierarchy.....	18
5.2.3 MSM root.....	18
5.2.4 Channel scope.....	19
5.2.5 Information scope .....	19
5.2.6 Channel use .....	19
5.3 Publication expiration.....	20
5.4 Topics.....	21
5.4.1 Topic definition .....	21
5.4.2 Topic names .....	21
5.5 Sessions .....	22
5.6 Security .....	22
5.6.1 Secure message exchanges .....	22
5.6.2 Security tokens on channels .....	22
5.6.3 Security token format.....	23
5.6.4 MSM service provider implementations.....	23
6 Service definitions .....	23
6.1 Type definitions .....	23
6.2 Defined return value of services.....	24
6.3 Channel management services .....	25
6.3.1 Create channel .....	25
6.3.2 Add security tokens .....	25
6.3.3 Remove security tokens.....	26



6.3.4	Delete channel .....	26
6.3.5	Get channel .....	26
6.3.6	Get channels .....	27
6.4	Notify listener service .....	27
6.5	Provider publication services .....	28
6.5.1	Open publication session .....	28
6.5.2	Post publication .....	28
6.5.3	Expire publication .....	28
6.5.4	Close publication session .....	29
6.6	Consumer publication services .....	29
6.6.1	Open subscription session .....	29
6.6.2	Read publication .....	30
6.6.3	Remove publication .....	30
6.6.4	Close subscription session .....	31
6.7	Provider request services .....	31
6.7.1	Open provider request session .....	31
6.7.2	Read request .....	32
6.7.3	Remove request .....	32
6.7.4	Post response .....	33
6.7.5	Close provider request session .....	33
6.8	Consumer request services .....	33
6.8.1	Open consumer request session .....	33
6.8.2	Post request .....	34
6.8.3	Read response .....	34
6.8.4	Remove response .....	35
6.8.5	Close consumer request session .....	35
7	Scenarios .....	36
7.1	Publish-subscribe scenarios .....	36
7.1.1	Simple publish-subscribe scenario .....	36
7.1.2	Publish-subscribe scenario with multiple messages .....	36
7.1.3	Publish-subscribe scenario without notification .....	37
7.1.4	Multiple publisher scenario .....	38
7.1.5	Publish-subscribe scenario with publication expiration .....	39
7.2	Request channel scenarios .....	40
7.2.1	Request-response scenario with notification .....	40
7.2.2	Request-response scenario without notification .....	41
7.2.3	Multiple providers .....	42
8	Conformance .....	43
Annex A (informative)	MSM service provider considerations .....	44
A.1	Service provider considerations .....	44
A.2	Notification .....	44
A.3	Security considerations .....	44
A.4	MSM application implementation considerations .....	44
A.5	MSM channel security considerations .....	45
A.6	MSM session ID considerations .....	45
A.7	Data format validation .....	45
A.8	Allowed application checking .....	45
A.9	Data exchange logging .....	45
A.10	Common error handling .....	45

A.11	Data transformation services.....	46
A.12	Cross company bridges.....	46
A.13	Message maintenance .....	47
Annex B (informative)	Enterprise Service Buses .....	48
Bibliography	.....	50
Figure 1	– Steps in application-to-application communication .....	9
Figure 2	– Defined standards at each level .....	9
Figure 3	– Positioning and role of MSM.....	14
Figure 4	– Messaging service model terminology .....	15
Figure 5	– Channel management services .....	16
Figure 6	– Publication channel services .....	17
Figure 7	– Services for request.....	17
Figure 8	– Notify listener service.....	18
Figure 9	– Changes and checkpoint channel example .....	20
Figure 10	– Security of channels.....	23
Figure 11	– Publication scenario with notification.....	36
Figure 12	– Publication scenario with multiple messages .....	37
Figure 13	– Publication without notification.....	38
Figure 14	– Publication with multiple provider applications.....	39
Figure 15	– Publication with expired publications .....	40
Figure 16	– GET/SHOW request service scenario.....	41
Figure 17	– CHANGE / RESPONSE request service scenario.....	42
Figure 18	– Multiple providers CHANGE/RESPONSE scenario .....	43
Figure A.1	– Transformation services with the MSM service provider.....	46
Figure A.2	– Cross company bridge between multiple MSMs .....	47
Figure B.1	– Standard interface to ESBs and other message exchange systems.....	49
Table 1	– Application roles, channels, and services .....	16
Table 2	– Channel use for transaction verbs .....	19
Table 3	– Type definitions.....	24
Table 4	– Service fault definitions .....	24
Table 5	– Service parameter definitions .....	25
Table 6	– Create channel.....	25
Table 7	– Add security tokens.....	25
Table 8	– Remove security tokens .....	26
Table 9	– Delete channel .....	26
Table 10	– Get channel.....	27
Table 11	– Get channels.....	27
Table 12	– Notify listener .....	27
Table 13	– Open publication session .....	28
Table 14	– Post publication.....	28
Table 15	– Expire publication.....	29

Table 16 – Close publication session .....	29
Table 17 – Open subscription session.....	30
Table 18 – Read publication .....	30
Table 19 – Remove publication .....	31
Table 20 – Close subscription session .....	31
Table 21 – Open provider request session .....	32
Table 22 – Read request.....	32
Table 23 – Remove request .....	33
Table 24 – Post response .....	33
Table 25 – Close provider request session.....	33
Table 26 – Open consumer request session.....	34
Table 27 – Post request .....	34
Table 28 – Read response .....	35
Table 29 – Remove response .....	35
Table 30 – Close consumer request session .....	35

## **iTeh STANDARD PREVIEW** **(standards.iteh.ai)**

[oSIST prEN IEC 62264-6:2020](https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-acc9-db5487a1585f/osist-pren-iec-62264-6-2020)

<https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-acc9-db5487a1585f/osist-pren-iec-62264-6-2020>

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## ENTERPRISE-CONTROL SYSTEM INTEGRATION –

## Part 6: Messaging service model

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62264-6 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee TC65: Industrial-process measurement, control and automation.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
65E/706/FDIS	65E/724/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62264, published under the general title *Enterprise-control system integration*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## **iTeh STANDARD PREVIEW (standards.iteh.ai)**

[oSIST prEN IEC 62264-6:2020](#)

<https://standards.iteh.ai/catalog/standards/sist/4796e2ee-aabf-4a76-aec9-db5487a1585f/osist-pren-iec-62264-6-2020>

## INTRODUCTION

This document is based on the use of IEC 62264 object models defined in IEC 62264-2, IEC 62264-4 and IEC 62264-5 to define a set of services that may be used to exchange messages. This document defines a messaging service model (MSM) for exchanging messages in a publish-subscribe mode and a request-response mode.

The Messaging Service Model provides a method for applications to send and receive messages from MSM service providers without regard to the underlying communication mechanism, as part of a complete application-to-application data exchange.

This document defines a model for message exchange services (Messaging Service Model) that are designed to provide a technology independent method for sending and receiving transaction messages to or from underlying exchange services.

The knowledge requirements to interface to just one message exchange system can be immense and are usually not transferable to a different system. MSM defines a single interface, independent of the underlying exchange services, for exchanging data objects defined by IEC 62264-2 and by IEC 62264-4. This removes the need for vendors to build custom interface after custom interface, and for end users to get locked into a single vendor because their investment prevents them from reusing any of the integration efforts.

Exchanging the data objects between different computer system applications involves multiple different steps, as shown in Figure 1.

- ITeh STANDARD PREVIEW**  
**Standards (Iec)**  
**62264-4 defines models of a global format for Level 3-3 data exchanges.**  
**IEC 62264-4 defines models of a global format for Level 3-3 data exchanges.**  
**http://standards.iteh.ai/catalog/standards/sist/62264-6-2020/iec-62264-6-2020**
- a) The applications usually have different internal representations of exchanged objects in their own local data stores. This representation is usually converted from the local format to a commonly accepted global format. IEC 62264-2 defines models of a global format for Level 4-3 data exchanges. IEC 62264-4 defines models of a global format for Level 3-3 data exchanges. This conversion, from local to global and global to local, is usually performed twice for any two-way communications.

**EXAMPLE 1** Assume two applications, ALPHA and BETA: the ALPHA application initiates a data exchange with the BETA application, and BETA responds back to ALPHA. The format conversions are: ALPHA's local format to global format for the request data, global format to BETA's local format for the request data, BETA's local format to global format for the response data, and global format to ALPHA's format for the response data.

- b) Conversion is performed to align the namespaces among the exchanging applications and is usually performed four times for any two-way communications.

**EXAMPLE 2** Names for elements of data can be codes, tag names, or equipment identifiers.

**EXAMPLE 3** Data which are represented in one element namespace, such as codes 1,2,3,4, can have a different namespace in another application, such as codes Ok, Done, Error, Delay.

- c) Once information is in the global format with global names, the exchanged information is sent from one application to another application.
- d) Messages are transported from one application to another, either within the same computer environment or across computers. Transport mechanisms are defined in other standards, such as TCP/IP and Ethernet standards.
- e) When data exchange information is received, there are specific rules that define what resultant data are to be returned. The transaction rules are defined in IEC 62264-5.

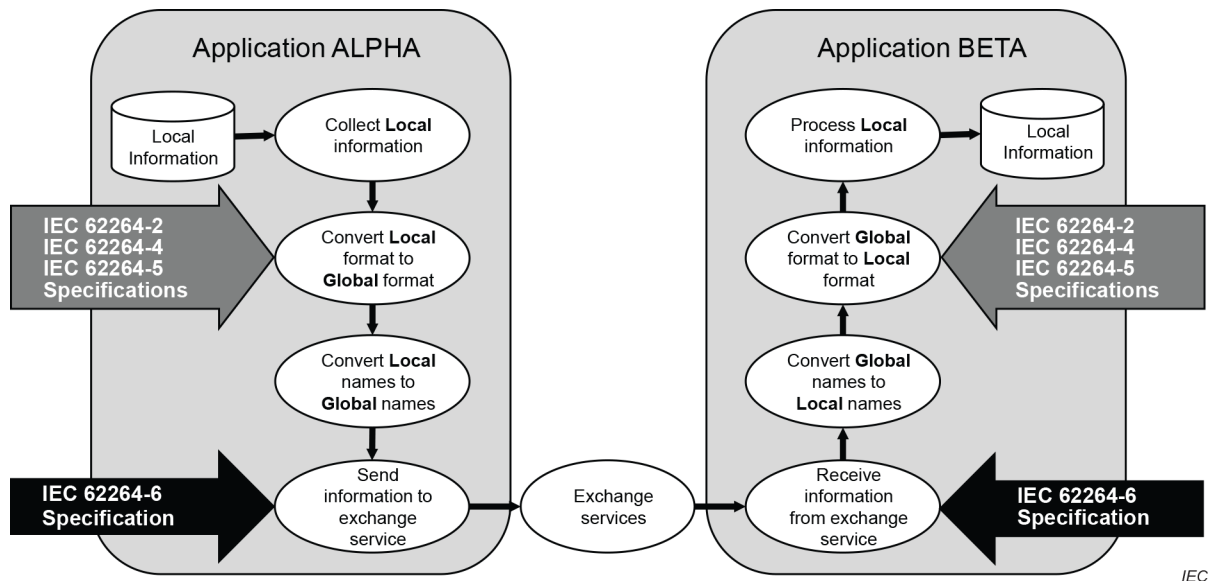


Figure 1 – Steps in application-to-application communication

MSM is a minimal interface subset that can reside on most exchange services and is based on well-defined and structured data objects and transaction messages.

Each layer shown in Figure 2 addresses a specific element of application data exchange.

- 1) A Data Object layer defines the meaning, format, and structure of the basic elements of exchanged information.

NOTE 1 This layer uses application space specific definitions, such as the IEC 62264-2 and IEC 62264-4 object definitions, MESA B2MML, MIMOSA CCOM objects, and "Nouns" defined in OAGIS.

- 2) A Transaction layer defines the meaning, format, and structure of actions to be taken on the data objects.

NOTE 2 This layer can use IEC 62264-5 transaction style specific definitions. Another transaction layer definition could be the OAGIS "Verb" definitions.

- 3) The MSM defines an interface to the OSI Application layer's services.
- 4) The application, presentation, session and lower level layers define the meaning, format, and structure for coordination, buffering, and exchange of messages or files. These layers contain transfer or exchange style specific definitions, such as Enterprise Service Buses, Enterprise Message Delivery Systems, the OPC UA specification (IEC 62541 standard), RSS, FTP, Named Pipes, Ethernet, TCP/IP, HTTP, and others.

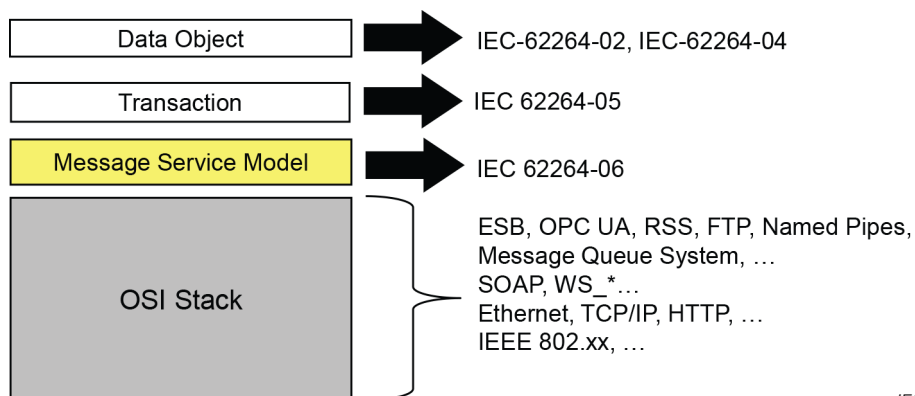


Figure 2 – Defined standards at each level