OPC unified architecture - Part 6: Mappings

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NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 62541-6:2020 sisaldab Euroopa standardi EN IEC 62541-6:2020 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 62541-6:2020 consists of the English text of the European standard EN IEC 62541-6:2020.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 04.09.2020.	Date of Availability of the European standard is 04.09.2020.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 25.040.40, 35.100.05

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62541-6

September 2020

ICS 35.100.05; 25.040.40

Supersedes EN 62541-6:2015 and all of its amendments and corrigenda (if any)

English Version

OPC Unified Architecture - Part 6: Mappings (IEC 62541-6:2020)

Architecture unifiée OPC - Partie 6: Mappings (IEC 62541-6:2020)

OPC Unified Architecture - Teil 6: Protokollabbildungen (IEC 62541-6:2020)

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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

Ref. No. EN IEC 62541-6:2020 E

European foreword

The text of document 65E/718/FDIS, future edition 3 of IEC 62541-6, prepared by SC 65E "Devices and integration in enterprise systems" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62541-6:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2021-05-17
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-08-17

This document supersedes EN 62541-6:2015 and all of its amendments and corrigenda (if any).

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Endorsement notice

The text of the International Standard IEC 62541-6:2020 was approved by CENELEC as a European Standard without any modification.

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 Where 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.

Publication	Year	Title	EN/HD	Year
IEC/TR 62541-1	-	OPC unified architecture - Part 1: Overview and concepts	CLC/TR 62541-1	-
IEC/TR 62541-2	-	OPC unified architecture - Part 2: Security model	CLC/TR 62541-2	-
IEC 62541-3	-	OPC Unified Architecture - Part 3: Address Space Model	-	-
IEC 62541-4	-	OPC Unified Architecture - Part 4: Services	-	-
IEC 62541-5	-	OPC Unified Architecture - Part 5: Information Model	-	-
IEC 62541-7	-	OPC unified architecture - Part 7: Profiles	EN IEC 62541-7	-
IEC 62541-12	-	OPC unified architecture - Part 12: Discovery and global services	EN IEC 62541-12	-
ISO 8601-1	2019	Date and time - Representations for information interchange – Part 1: Basic rules	-	-
XML Schema Part 2	-	XML Schema Part 2: Datatypes http://www.w3.org/TR/xmlschema-2/	-	-
SOAP Part 1	-	SOAP Version 1.2 Part 1: Messaging Framework http://www.w3.org/TR/soap12-part1/	-	-
SSL/TLS: RFC 5246	-	The TLS Protocol Version 1.2 http://tools.ietf.org/html/rfc5246.txt	-	-
X.509 v3: ISO/IEC-9594-8		Information technology – Open Systems Interconnection – The Directory: Public-key and attribute certificate frameworks	-	-
HTTP: RFC 2616	-	Hypertext Transfer Protocol – HTTP/1.1 http://www.ietf.org/rfc/rfc2616.txt	-	-

Publication	Year	Title	EN/HD	Year
HTTPS: RFC 2818	-	HTTP Over TLS http://www.ietf.org/rfc/rfc2818.txt	-	-
Base64: RFC 3548	-	The Base16, Base32, and Base64 Data Encodings http://www.ietf.org/rfc/rfc3548.txt	-	-
X690: ISO/IEC 8825-1	-	Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)	-	-
IEEE-754	-	Standard for Floating-Point Arithmetic	-	-
HMAC	-	HMAC – Keyed-Hashing for Message Authentication http://www.ietf.org/rfc/rfc2104.txt	-	-
PKCS #1:	-	PKCS #1 – RSA Cryptography Specifications Version 2.0 http://www.ietf.org/rfc/rfc2437.txt	-	-
PKCS #12	-	PKCS #12 – Personal Information Exchange Syntax v1.1 http://www.ietf.org/rfc/rfc7292.txt	-	-
FIPS 180-4	-	Secure Hash Standard (SHS) https://csrc.nist.gov/publications/detail/fips/180/4/final	-	-
FIPS 197	-	Advanced Encryption Standard (AES) https://csrc.nist.gov/publications/detail/fips/197/final	-	-
UTF-8	-	UTF-8, a transformation format of ISO 10646 http://www.ietf.org/rfc/rfc3629.txt	-	-
RFC 3280	-	RFC 3280 – X.509 Public Key Infrastructure Certificate and CRL Profile http://www.ietf.org/rfc/rfc3280.txt	-	-
RFC 4514	-	RFC 4514 – LDAP: String Representation of Distinguished Names http://www.ietf.org/rfc/rfc4514.txt	-	-
NTP	-	RFC 1305 – Network Time Protocol (Version 3) Specification, Implementation and Analysis http://www.ietf.org/rfc/rfc1305.txt	-	-
Kerberos	-	Web Services Security – Kerberos Token Profile 1.1 http://docs.oasis-open.org/wss/v1.1/wss-v1.1-spec-os-KerberosTokenProfile.pdf	-	-
RFC 1738	-	RFC 1738 – Uniform Resource Locators (URL) http://www.ietf.org/rfc/rfc1738.txt	-	-
RFC 2141	-	RFC 2141 – URN Syntax http://www.ietf.org/rfc/rfc2141.txt	-	-
RFC 6455	-	RFC 6455 – The WebSocket Protocol http://www.ietf.org/rfc/rfc6455.txt	-	-

Publication	Year	Title	EN/HD	Year
RFC 7523	-	JSON Web Token (JWT) Profile for OAuth 2.0 Client Authentication and Authorization Grants https://tools.ietf.org/rfc/rfc7523.txt	-	-
RFC 6749	-	The OAuth 2.0 Authorization Framework http://www.ietf.org/rfc/rfc6749.txt	-	-
OpenID-Core	-	OpenID Connect Core 1.0 http://openid.net/specs/openid-connect-core-1_0.html	-	-
OpenID-Discovery	-	OpenID Connect Discovery 1.0 https://openid.net/specs/openid-connect-discovery-1_0.html	-	-
RFC 6960	-	RFC 6960 – X.509 Internet Public Key Infrastructure Online Certificate Status Protocol – OCSP https://www.ietf.org/rfc/rfc6960.txt	-	-

IEC 62541-6

Edition 3.0 2020-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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OPC unified architecture – Part 6: Mappings

Architecture unifiée OPC – Partie 6: Mappings

IEC 62541-6:2020-07(en-fr)

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IEC 62541-6

Edition 3.0 2020-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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OPC unified architecture – Part 6: Mappings

Architecture unifiée OPC – Partie 6: Mappings

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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OPC UNIFIED ARCHITECTURE –

Part 6: Mappings

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.
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International Standard IEC 62541-6 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

This third edition cancels and replaces the second edition published in 2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Encodings:
   - added JSON encoding for PubSub (non-reversible);
   - added JSON encoding for Client/Server (reversible);
   - added support for optional fields in structures;
   - added support for Unions.

b) Transport mappings:
   - added WebSocket secure connection – WSS;
   - added support for reverse connectivity;
   - added support for session-less service invocation in HTTPS.

c) Deprecated Transport (missing support on most platforms):
   - SOAP/HTTP with WS-SecureConversation (all encodings).

d) Added mapping for JSON Web Token.

e) Added support for Unions to NodeSet Schema.

f) Added batch operations to add/delete nodes to/from NodeSet Schema.

g) Added support for multi-dimensional arrays outside of Variants.

h) Added binary representation for Decimal data types.

i) Added mapping for an OAuth2 Authorization Framework.

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

FDIS	Report on voting
65E/718/FDIS	65E/734/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.

Throughout this document and the other parts of IEC 62541, certain document conventions are used:

Italics are used to denote a defined term or definition that appears in Clause 3 in one of the parts of the series.

Italics are also used to denote the name of a service input or output parameter or the name of a structure or element of a structure that are usually defined in tables.

The *italicized terms and names* are also, with a few exceptions, written in camel-case (the practice of writing compound words or phrases in which the elements are joined without spaces, with each element's initial letter capitalized within the compound). For example the defined term is *AddressSpace* instead of Address Space. This makes it easier to understand that there is a single definition for *AddressSpace*, not separate definitions for Address and Space.

A list of all parts of the IEC 62541 series, published under the general title *OPC Unified Architecture*, 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.

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