BS EN IEC 62541-4:2020

BSI Standards Publication

OPC Unified Architecture

Part 4: Services

bsi.

National foreword

This British Standard is the UK implementation of EN IEC 62541-4:2020. It is identical to IEC 62541-4:2020. It supersedes BS EN 62541-4:2015, which will be withdrawn on 17 August 2023.

The UK participation in its preparation was entrusted to Technical Committee GEL/65/3, Industrial communications: process measurement and control, including fieldbus.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

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Architecture Unifiée OPC - Partie 4: Services (IEC 62541-4:2020)

OPC Unified Architecture - Teil 4: Dienste (IEC 62541-4:2020)

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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

European foreword

The text of document 65E/716/FDIS, future edition 3 of IEC 62541-4, 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 62541-4:2020.

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• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2023-08-17

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Endorsement notice

The text of the International Standard IEC 62541-4:2020 was approved by CENELEC as a European Standard without any modification.

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OPC UNIFIED ARCHITECTURE –

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FOREWORD

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International Standard IEC 62541-4 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) Added ability to resend all data of monitored items in a Subscription using the ResendData Method.
b) Added support for durable Subscriptions (lifetime of hours or days).
c) Added Register2 and FindServersOnNetwork Services to support network-wide discovery using capability filters.
d) Removed definition of software certificates. Will be defined in a future edition.

e) Extended and partially revised the redundancy definition. Added sub-range definitions for ServiceLevel and added more terms for redundancy.

f) Added a section on how to use Authorization Services to request user access tokens.

g) Added JSON Web Tokens (JWTs) as a new user token.

h) Added the concept of session-less service invocation.

i) Added a generic structure that allows passing any number of attributes to the AddNodes Service.

j) Added requirement to protect against user identity token attacks.

k) Added new EncryptedSecret format for user identity tokens.

The text of this standard is based on the following documents:

FDIS	Report on voting
65E/716/FDIS	65E/732/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 the IEC 62541 series, 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.

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.

OPC UNIFIED ARCHITECTURE –

Part 4: Services

1 Scope

This part of IEC 62541 defines the OPC Unified Architecture (OPC UA) *Services*. The *Services* defined are the collection of abstract Remote Procedure Calls (RPC) that are implemented by OPC UA *Servers* and called by OPC UA *Clients*. All interactions between OPC UA *Clients* and *Servers* occur via these *Services*. The defined *Services* are considered abstract because no particular RPC mechanism for implementation is defined in this document. IEC 62541-6 specifies one or more concrete mappings supported for implementation. For example, one mapping in IEC 62541-6 is to XML Web Services. In that case the *Services* described in this document appear as the Web service methods in the WSDL contract.

Not all OPC UA *Servers* will need to implement all of the defined *Services*. IEC 62541-7 defines the *Profiles* that dictate which Services need to be implemented in order to be compliant with a particular *Profile*.

2 Normative references

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.

IEC TR 62541-1*, OPC Unified Architecture – Part 1: Overview and Concepts*

IEC TR 62541-2, *OPC Unified Architecture – Part 2: Security Model*

IEC 62541-3, *OPC Unified Architecture – Part 3: Address Space Model*

IEC 62541-5, *OPC Unified Architecture – Part 5: Information Model*

IEC 62541-6, *OPC Unified Architecture – Part 6: Mappings*

IEC 62541-7, *OPC Unified Architecture – Part 7: Profiles*

IEC 62541-8, *OPC Unified Architecture – Part 8: Data Access*

IEC 62541-11, *OPC Unified Architecture – Part 11: Historical Access*

IEC 62541-12[1], *OPC Unified Architecture – Part 12: Discovery and Global Services*

IEC 62541-13, *OPC Unified Architecture – Part 13: Aggregates*

[1] Under preparation. Stage at the time of publication: IEC CDV 62541-12:2018.