# IEC 62541-4

Edition 4.0 2025-12

# INTERNATIONAL STANDARD

**OPC unified architecture -**
**Part 4: Services**

ICS 25.040.40; 35.100.05

ISBN 978-2-8327-0833-0

IEC 62541-4:2025-12(en)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# OPC unified architecture - Part 4: Services

## 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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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. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2020. This edition constitutes a technical revision.

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

a) addition of new definitions to Method Call Service to allow optional Method arguments;
b) addition of reference to SystemStatusChangeEventType for event monitored item error scenarios;
c) enhancement of the general description of how determining if a Certificate is trusted;
d) addition of support for ECC;

e) addition of revisedAggregateConfiguration to AggregateFilterResult structure;

f) addition of INVALID to the BrowseDirection enumeration data type;

g) addition of INVALID to the TimestampsToReturn enumeration data type;

h) addition of definitions that make sure the subscription functionality works if retransmission queues are optional;

i) addition of client checks has been added to be symmetric to the Server Certificate check has been added;

j) clarification that ‘local’ top level domain is not appended by server into certificate and not checked by client when returned from LDS-ME;

k) addition of a definition for expiration behaviour of IssuedIdentityTokens;

l) addition of status code Good_PasswordChangeRequired to ActivateSession;

m) restriction of AdditionalInfo to servers in debug mode;

n) addition of new status code Bad_ServerTooBusy;

o) addition of definition for cases where server certificate must be contained in GetEndpoints response.

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

| Draft | Report on voting |
|---|---|
| 65E/1053/CDV | 65E/1129/RVC |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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 the "Terms and definitions" clause in one of the parts of the IEC 62541 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, 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 in 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

## 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 UA-TCP UA-SC UA-Binary. In that case the *Services* described in this document appear as OPC UA Binary encoded payload, secured with OPC UA Secure Conversation and transported via OPC UA TCP.

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

A BNF (Backus-Naur form) for browse path names is described in Annex A.

## 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 62541-1, *OPC Unified Architecture - Part 1: Overview and Concepts*

IEC 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 62541-9, *OPC unified architecture - Part 9: Alarms and Conditions*

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

IEC 62541-12, *OPC Unified Architecture - Part 12: Discovery*

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

IEC 62541-18, *OPC Unified Architecture - Part 18: Role-Based Security*

# Bibliography

IEC 62541 (all parts), *OPC unified architecture*

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