SVENSK STANDARD

SS-EN IEC 62541-7, utg 4:2026

Fastställd	Sida	Ansvarig kommitté
2026-11-18	1 (163)	SEK TK 65

© Copyright SEK Svensk Elstandard. Reproduction in any form without permission is prohibited.

OPC Unified Architecture – Del 7: Profiler

OPC Unified Architecture – Part 7: Profiles

Som svensk standard gäller europastandarden EN IEC 62541-7:2026. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 62541-7:2026.

Nationellt förord

Europastandarden EN IEC 62541-7:2026

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62541-7, Fourth edition, 2025 - OPC Unified Architecture – Part 7: Profiles**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN IEC 62541-7, utg 3:2020 med eventuella tillägg, ändringar och rättelser gäller ej fr o m 2029-02-28.

ICS 25.040.40; 35.100.05

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
Postadress: Box 1042, 172 21 Sundbyberg
Telefon: 08 - 444 14 00.
E-post: sek@elstandard.se. Internet: elstandard.se

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1042
172 21 Sundbyberg
Tel 08-444 14 00
elstandard.se

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62541-7

February 2026

ICS 25.040.40; 35.100.05

Supersedes EN IEC 62541-7:2020

English Version

OPC Unified Architecture - Part 7: Profiles (IEC 62541-7:2025)

Architecture unifiée OPC - Partie 7: Profils
(IEC 62541-7:2025)

OPC Unified Architecture - Teil 7: Profile
(IEC 62541-7:2025)

This European Standard was approved by CENELEC on 2026-01-20. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists 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, Türkiye and the United Kingdom.



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

© 2026 CENELEC All rights of exploitation in any form and by any means reserved worldwide for CENELEC Members.

Ref. No. EN IEC 62541-7:2026 E

SEK Svensk Elstandard

SS-EN IEC 62541-7, utg 4:2026

European foreword

The text of document 65E/1184/FDIS, future edition 4 of IEC 62541-7, 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 62541-7:2026.

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) 2027-02-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2029-02-28

This document supersedes EN IEC 62541-7:2020 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 standardization request addressed to CENELEC by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62541-7:2025 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.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 62541-1	-	OPC Unified Architecture - Part 1: Overview and concepts	EN IEC 62541-1	-
IEC 62541-2	-	OPC unified architecture - Part 2: Security model	EN IEC 62541-2[1]	-
IEC 62541-3	-	OPC Unified Architecture - Part 3: Address Space Model	EN IEC 62541-3	-
IEC 62541-4	-	OPC unified architecture - Part 4: Services	EN IEC 62541-4	-
IEC 62541-5	-	OPC Unified architecture - Part 5: Information Model	EN IEC 62541-5	-
IEC 62541-6	-	OPC unified architecture - Part 6: Mappings	EN IEC 62541-6	-
IEC 62541-8	-	OPC unified architecture - Part 8: Data access	EN IEC 62541-8	-
IEC 62541-9	-	OPC Unified Architecture - Part 9: Alarms and Conditions	EN IEC 62541-9[2]	-
IEC 62541-10	-	OPC Unified Architecture - Part 10: Programs	EN IEC 62541-10	-
IEC 62541-11	-	OPC Unified Architecture - Part 11: Historical Access	EN IEC 62541-11	-
IEC 62541-12	-	OPC unified architecture - Part 12: Discovery and global services	EN IEC 62541-12	-
IEC 62541-13	-	OPC Unified Architecture - Part 13: Aggregates	EN IEC 62541-13	-
IEC 62541-14	-	OPC unified architecture - Part 14: PubSub	EN IEC 62541-14[3]	-
IEC 62541-15	-	OPC Unified Architecture - Part 15: Safety	EN IEC 62541-15	-

[1] Under preparation. Stage at the time of publication: FprEN IEC 62541-2:2025.

[2] Under preparation. Stage at the time of publication: prEN IEC 62541-9:2024.

[3] Under preparation. Stage at the time of publication: prEN IEC 62541-14:2024.

IEC 62541-16	-	OPC unified architecture - Part 16: State Machines	EN IEC 62541-16	-
IEC 62541-17	-	OPC unified architecture - Part 17: Alias Names	EN IEC 62541-17	-
IEC 62541-18	-	OPC unified architecture - Part 18: Role-Based Security	EN IEC 62541-18	-
IEC 62541-19	-	OPC unified architecture - Part 19: Dictionary Reference	EN IEC 62541-19	-
IEC 62541-20	-	OPC unified architecture - Part 20: File transfer	EN IEC 62541-20	-
IEC 62541-22	-	OPC unified architecture - Part 22: Base Network Model	EN IEC 62541-22	-
IEC 62541-24	-	OPC unified architecture - Part 24: Scheduler	EN IEC 62541-24	-
IEEE 802.1AS	2011	IEEE Standard for Local and Metropolitan Area Networks - Timing and Synchronization for Time-Sensitive Applications in Bridged Local Area Networks	-	-
IEEE 1588	2019	IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems	-	-
RFC 2104	-	HMAC: Keyed-Hashing for Message Authentication	-	-
RFC 3174	-	US Secure Hash Algorithm 1 (SHA1)	-	-
RFC 3686	-	Using Advanced Encryption Standard (AES) Counter Mode with IPsec Encapsulating Security Payload (ESP)	-	-
RFC 3447	-	Public-Key Cryptography Standards (PKCS) #1: RSA Cryptography	-	-
RFC 4634	-	US Secure Hash Algorithms (SHA and HMAC-SHA)	-	-
RFC 5869	-	HMAC-based Extract-and-Expand Key Derivation Function (HKDF)	-	-
RFC 6243	-	With-defaults Capability for NETCONF	-	-
RFC 8439	-	ChaCha20 and Poly1305 for IETF Protocols	-	-

IEC 62541-7

Edition 4.0 2025-12

INTERNATIONAL STANDARD

OPC Unified Architecture -
Part 7: Profiles

ICS 25.040.40; 35.100.05

ISBN 978-2-8327-0911-5

SEK Svensk Elstandard

SS-EN IEC 62541-7, utg 4:2026

IEC 62541-7:2025-12(en)

CONTENTS

FOREWORD 9
1 Scope 11
2 Normative references 11
3 Terms, definitions and abbreviated terms 12
3.1 Terms and definitions 12
3.2 Abbreviated terms 13
4 Profile model 14
4.1 General 14
4.2 *ConformanceUnits* and Conformance Groups 15
4.3 Profiles 15
4.4 Profile Categories 15
4.5 Profile conformance 16
4.6 Conventions for Profile definitions 16
4.7 Profile versioning 16
4.8 Applications 16
5 *ConformanceUnits* 17
5.1 Conformance Groups 17
5.2 ConformanceUnits by ConformanceGroup 18
5.2.1 Miscellaneous 18
5.2.2 Address Space Model 20
5.2.3 Base Information 22
5.2.4 Base File Information 29
5.2.5 Base Services 30
5.2.6 Discovery Services 31
5.2.7 Session Services 32
5.2.8 View Services 33
5.2.9 Attribute Services 34
5.2.10 Subscription Services 35
5.2.11 Monitored Item Services 36
5.2.12 Method Services 38
5.2.13 Node Management Services 38
5.2.14 Auditing 39
5.2.15 Redundancy 40
5.2.16 Protocol and Encoding 40
5.2.17 Security General 41
5.2.18 Security User Token 46
5.2.19 Security Algorithms 48
5.2.20 Safety 54
5.2.21 Data Access 54
5.2.22 Alarms and Conditions 56
5.2.23 Historical Access 59
5.2.24 Aggregates 62
5.2.25 GDS 67
5.2.26 AliasName 68
5.2.27 Scheduler 68
5.2.28 PubSub General 69

5.2.29 PubSub Configuration 71
5.2.30 PubSub Discovery 74
5.2.31 PubSub Security 74
5.2.32 PubSub SKS 75
5.2.33 PubSub Limits (Deprecated) 76
6 Profiles 79
6.1 Profiles by Category 79
6.1.1 Application Profiles 79
6.1.2 Server 80
6.1.3 Client 82
6.1.4 Publisher 85
6.1.5 Subscriber 85
6.1.6 Transport 86
6.1.7 Security 87
6.1.8 Global Directory Service 88
7 Profile Definitions 88
7.1 Application Profiles 88
7.1.1 Nano Embedded Device 2022 Server Profile 88
7.1.2 Micro Embedded Device 2022 Server Profile 88
7.1.3 Embedded 2022 UA Server Profile 89
7.1.4 Standard 2022 UA Server Profile 89
7.1.5 Minimum UA Client 2022 Profile 89
7.1.6 Standard UA Client 2022 Profile 90
7.1.7 Global Discovery Server 2022 Profile 90
7.1.8 Global Discovery and Certificate Mgmt 2022 Server 91
7.1.9 Global Certificate Management Client 2022 Profile 91
7.1.10 Security Key Server Profile 91
7.1.11 Publisher UDP UADP Periodic Fixed 2022 Profile 92
7.1.12 Publisher UDP UADP Dynamic 2022 Profile 92
7.1.13 Publisher UDP UADP Flexible Layout 2022 Profile 93
7.1.14 Subscriber UDP UADP Periodic Fixed 2022 Profile 93
7.1.15 Subscriber UDP UADP Dynamic 2022 Profile 93
7.1.16 Subscriber UDP UADP Flexible Layout 2022 Profile 94
7.2 Server 94
7.2.1 Core 2022 Server Facet 94
7.2.2 Exposes Type System Server Facet 95
7.2.3 Base Server Behaviour Facet 97
7.2.4 Method 2022 Server Facet 97
7.2.5 File Access Server Facet 97
7.2.6 Temporary File Access Server Facet 97
7.2.7 Dictionary Reference Server Facet 98
7.2.8 AliasName Server Facet 98
7.2.9 AliasName Aggregating Server Facet 98
7.2.10 State Machine 2022 Server Facet 98
7.2.11 Scheduler Base Server Facet 99
7.2.12 Scheduler Configuration Server Facet 99
7.2.13 Node Management 2022 Server Facet 99
7.2.14 Attribute WriteMask Server Facet 99

7.2.15 Publisher Information Model 2022 Facet 100
7.2.16 Subscriber Information Model 2022 Facet 100
7.2.17 Documentation Server Facet 101
7.2.18 Subnet Discovery Server Facet 101
7.2.19 Reverse Connect Server Facet 101
7.2.20 Sessionless Server Facet 101
7.2.21 Global Certificate Management Server Facet 102
7.2.22 Authorization Service Server Facet 102
7.2.23 KeyCredential Service Server Facet 102
7.2.24 User Role Base 2022 Server Facet 102
7.2.25 User Role Management 2022 Server Facet 102
7.2.26 User Token – Anonymous Server Facet 103
7.2.27 User Token – User Name Password Server Facet 103
7.2.28 User Token – X509 Certificate Server Facet 103
7.2.29 User Token – JWT Server Facet 103
7.2.30 Embedded DataChange Subscription 2022 Server Facet 104
7.2.31 Standard DataChange Subscription 2022 Server Facet 104
7.2.32 Durable Subscription 2022 Server Facet 104
7.2.33 Data Access Server Facet 105
7.2.34 ComplexType 2017 Server Facet 105
7.2.35 Standard Event Subscription 2022 Server Facet 106
7.2.36 Model Change Event Server Facet 106
7.2.37 Auditing 2022 Server Facet 107
7.2.38 Request State Change Server Facet 107
7.2.39 Address Space Notifier Server Facet 107
7.2.40 A & C Base Condition 2022 Server Facet 107
7.2.41 A & C Refresh2 2022 Server Facet 108
7.2.42 A & C Address Space Instance 2022 Server Facet 108
7.2.43 A & C Enable 2022 Server Facet 108
7.2.44 A & C Previous Instances 2022 Server Facet 108
7.2.45 A & C Acknowledgeable Alarm 2022 Server Facet 109
7.2.46 A & C Alarm 2022 Server Facet 109
7.2.47 A & C Exclusive Alarming 2022 Server Facet 110
7.2.48 A & C Non–Exclusive Alarming 2022 Server Facet 110
7.2.49 A & C Alarm Auditing Server Facet 110
7.2.50 A & C AlarmMetrics Server Facet 111
7.2.51 A & C CertificateExpiration 2022 Server Facet 111
7.2.52 A & C Dialog 2022 Server Facet 111
7.2.53 A & E Wrapper 2022 Facet 112
7.2.54 Historical Raw Data 2022 Server Facet 112
7.2.55 Historical Data AtTime 2022 Server Facet 113
7.2.56 Historical Aggregate 2022 Server Facet 113
7.2.57 Historical Access Modified Data 2022 Server Facet 114
7.2.58 Historical Annotation 2022 Server Facet 114
7.2.59 Historical Access Structured Data 2022 Server Facet 115
7.2.60 Historical Data Update 2022 Server Facet 115
7.2.61 Historical Data Insert 2022 Server Facet 115
7.2.62 Historical Data Replace 2022 Server Facet 116

7.2.63 Historical Data Delete 2022 Server Facet 116
7.2.64 Base Historical Event 2022 Server Facet 116
7.2.65 Historical Event Update 2022 Server Facet 116
7.2.66 Historical Event Insert 2022 Server Facet 116
7.2.67 Historical Event Replace 2022 Server Facet 117
7.2.68 Historical Event Delete 2022 Server Facet 117
7.2.69 Aggregate Subscription 2022 Server Facet 117
7.2.70 Client Redundancy Server Facet 118
7.2.71 Redundancy Transparent Server Facet 118
7.2.72 Redundancy Visible Server Facet 118
7.3 Client 119
7.3.1 Core 2022 Client Facet 119
7.3.2 Minimum UA Client Facet 119
7.3.3 Base Client Behaviour Facet 120
7.3.4 AddressSpace Lookup Client Facet 120
7.3.5 Method Client Facet 120
7.3.6 Diagnostic Client Facet 121
7.3.7 Entry Level Support 2015 Client Facet 121
7.3.8 Multi–Server Client Connection Facet 121
7.3.9 File Access Client Facet 121
7.3.10 Temporary File Access Client Facet 121
7.3.11 Request State Change Client Facet 122
7.3.12 AliasName Client Facet 122
7.3.13 State Machine Client Facet 122
7.3.14 Scheduler Configuration Client Facet 122
7.3.15 Advanced Type Programming Client Facet 122
7.3.16 Node Management Client Facet 123
7.3.17 Documentation – Client 123
7.3.18 Discovery Client Facet 123
7.3.19 Subnet Discovery Client Facet 123
7.3.20 Global Discovery Client Facet 124
7.3.21 Reverse Connect Client Facet 124
7.3.22 Sessionless Client Facet 124
7.3.23 User Role Management Client Facet 124
7.3.24 User Token – Anonymous Client Facet 124
7.3.25 User Token – User Name Password Client Facet 125
7.3.26 User Token – X509 Certificate Client Facet 125
7.3.27 User Token – JWT Client Facet 125
7.3.28 Global Certificate Management Client Facet 125
7.3.29 KeyCredential Service Client Facet 125
7.3.30 Access Token Request Client Facet 126
7.3.31 Attribute Read Client Facet 126
7.3.32 Attribute Write Client Facet 126
7.3.33 DataChange Subscriber 2022 Client Facet 127
7.3.34 Durable Subscription Client Facet 127
7.3.35 DataAccess Client Facet 127
7.3.36 Event Subscriber Client Facet 128
7.3.37 Base Event Processing Client Facet 128

7.3.38 Auditing Client Facet 128
7.3.39 Notifier and Source Hierarchy Client Facet 129
7.3.40 A & C Base Condition Client Facet 129
7.3.41 A & C Refresh2 Client Facet 129
7.3.42 A & C Address Space Instance Client Facet 129
7.3.43 A & C Enable Client Facet 129
7.3.44 A & C Previous Instances Client Facet 130
7.3.45 A & C Alarm Client Facet 130
7.3.46 A & C Exclusive Alarming Client Facet 130
7.3.47 A & C Non–Exclusive Alarming Client Facet 131
7.3.48 A & C AlarmMetrics Client Facet 131
7.3.49 A & C CertificateExpiration Client Facet 131
7.3.50 A & C Dialog Client Facet 131
7.3.51 A & E Proxy Facet 132
7.3.52 Historical Access Client Facet 133
7.3.53 Historical Data AtTime Client Facet 133
7.3.54 Historical Aggregate Client Facet 133
7.3.55 Historical Annotation Client Facet 134
7.3.56 Historical Access Modified Data Client Facet 134
7.3.57 Historical Structured Data Access Client Facet 134
7.3.58 Historical Structured Data AtTime Client Facet 135
7.3.59 Historical Structured Data Modified Client Facet 135
7.3.60 Historical Access Client Server Timestamp Facet 135
7.3.61 Historical Data Update Client Facet 135
7.3.62 Historical Data Insert Client Facet 135
7.3.63 Historical Data Replace Client Facet 135
7.3.64 Historical Data Delete Client Facet 136
7.3.65 Historical Structured Data Update Client Facet 136
7.3.66 Historical Structured Data Insert Client Facet 136
7.3.67 Historical Structured Data Replace Client Facet 136
7.3.68 Historical Structured Data Delete Client Facet 136
7.3.69 Historical Events Client Facet 136
7.3.70 Historical Event Update Client Facet 137
7.3.71 Historical Event Insert Client Facet 137
7.3.72 Historical Event Replace Client Facet 137
7.3.73 Historical Event Delete Client Facet 137
7.3.74 Aggregate Subscriber Client Facet 137
7.3.75 Redundant Client Facet 138
7.3.76 Redundancy Switch Client Facet 139
7.4 Publisher 139
7.4.1 Publisher Message Security Facet 139
7.4.2 Publisher Cyclic Limits Facet (Deprecated) 139
7.4.3 Publisher Acyclic Limits Facet (Deprecated) 139
7.4.4 Publisher UADP Periodic Fixed Layout Facet 140
7.4.5 Publisher UADP Dynamic Data or Events Facet 140
7.4.6 Publisher UADP Flexible Layout Facet 140
7.4.7 Publisher Parameter Configuration Facet 140
7.4.8 Publisher Component Configuration Facet 141

7.5 Subscriber 141
7.5.1 Subscriber Message Security Facet 141
7.5.2 Subscriber Cyclic Limits Facet (Deprecated) 142
7.5.3 Subscriber Acyclic Limits Facet (Deprecated) 142
7.5.4 Subscriber UADP Periodic Fixed Layout Facet 142
7.5.5 Subscriber UADP Dynamic Data or Events Facet 142
7.5.6 Subscriber UADP Flexible Layout Facet 143
7.5.7 Subscriber Parameter Configuration Facet 143
7.5.8 Subscriber Component Configuration Facet 143
7.6 Transport 144
7.6.1 UA–TCP UA–SC UA–Binary 144
7.6.2 HTTPS UA–Binary 144
7.6.3 HTTPS UA–XML 144
7.6.4 HTTPS UA–JSON 144
7.6.5 WSS UA–SC UA–Binary 145
7.6.6 WSS UA–JSON 145
7.6.7 PubSub UDP UADP 145
7.6.8 PubSub ETH UADP 145
7.6.9 PubSub MQTT UADP 145
7.6.10 PubSub MQTT JSON 146
7.6.11 PubSub AMQP UADP 146
7.6.12 PubSub AMQP JSON 146
7.6.13 SecurityPolicy [B] – Basic256Sha256 146
7.6.14 SecurityPolicy – Basic256 (Deprecated) 147
7.6.15 SafetyAutomationComponent Facet (Deprecated) 147
7.6.16 SafetyProvider Facet 148
7.6.17 SafetyProviderServer Facet 148
7.6.18 SafetyProviderPubSub Facet 148
7.6.19 SafetyProviderServerMapper Facet 148
7.6.20 SafetyProviderPubSubMapper Facet 148
7.6.21 SafetyConsumer Facet 148
7.6.22 SafetyConsumerClient Facet 149
7.6.23 SafetyConsumerPubSub Facet 149
7.6.24 SafetyConsumerPubSubMapper Facet 149
7.7 Security 149
7.7.1 SecurityPolicy – None 149
7.7.2 SecurityPolicy [A] – Aes128–Sha256–RsaOaep 150
7.7.3 SecurityPolicy – Aes256–Sha256–RsaPss 150
7.7.4 SecurityPolicy [ECC–A] – ECC–curve25519 151
7.7.5 SecurityPolicy [ECC–B] – ECC–nistP256 151
7.7.6 SecurityPolicy – ECC–nistP384 152
7.7.7 SecurityPolicy – ECC–brainpoolP256r1 152
7.7.8 SecurityPolicy – ECC–brainpoolP384r1 153
7.7.9 SecurityPolicy – ECC–curve448 154
7.7.10 SecurityPolicy – Basic128Rsa15 (Deprecated) 154
7.7.11 SecurityPolicy [A] – PubSub–Aes128–CTR 155
7.7.12 SecurityPolicy – PubSub–Aes256–CTR 155
7.7.13 Security Time Synchronization 156

7.7.14 Security User Access Control Base 156
7.7.15 Security User Access Control Full 156
7.7.16 Best Practice – Audit Events 156
7.7.17 Best Practice – Alarm Handling 156
7.7.18 Best Practice – Random Numbers 157
7.7.19 Best Practice – Timeouts 157
7.7.20 Best Practice – Administrative Access 157
7.7.21 Best Practice – Strict Message Handling 157
7.7.22 Best Practice – Audit Events Client 157
7.7.23 TransportSecurity – TLS 1.2 157
7.7.24 TransportSecurity – TLS 1.2 with PFS 158
7.7.25 TransportSecurity – TLS 1.0 (Deprecated) 158
7.7.26 TransportSecurity – TLS 1.1 (Deprecated) 158
7.7.27 MQTT UserName 159
7.7.28 AMQP SASL Plain 159
7.8 Global Directory Service 159
7.8.1 Global Service Authorization Request Server Facet 159
7.8.2 Global Service KeyCredential Pull Facet 159
7.8.3 Global Service KeyCredential Push Facet 159
7.8.4 GDS AliasName Server Facet 160

Figure 1 – Profile – ConformanceUnit – TestCases 14

Table 1 – Profile Categories 15
Table 2 – Conformance Groups 17
Table 3 – Miscellaneous 18
Table 4 – Address Space Model 20
Table 5 – Base Information 22
Table 6 – Base File Information 29
Table 7 – Base Services 30
Table 8 – Discovery Services 31
Table 9 – Session Services 32
Table 10 – View Services 33
Table 11 – Attribute Services 34
Table 12 – Subscription Services 35
Table 13 – Monitored Item Services 36
Table 14 – Method Services 38
Table 15 – Node Management Services 38
Table 16 – Auditing 39
Table 17 – Redundancy 40
Table 18 – Protocol and Encoding 40
Table 19 – Security General 41
Table 20 – Security User Token 46
Table 21 – Security Algorithms 48
Table 22 – Safety 54

Table 23 – Data Access 54
Table 24 – Alarms and Conditions 56
Table 25 – Historical Access 59
Table 26 – Aggregates 62
Table 27 – GDS 67
Table 28 – AliasName 68
Table 29 – Scheduler 68
Table 30 – PubSub General 69
Table 31 – PubSub Configuration 71
Table 32 – PubSub Discovery 74
Table 33 – PubSub Security 74
Table 34 – PubSub SKS 75
Table 35 – PubSub Limits 76
Table 36 – Application Profiles 79
Table 37 – Server 80
Table 38 – Client 82
Table 39 – Publisher 85
Table 40 – Subscriber 85
Table 41 – Transport 86
Table 42 – Security 87
Table 43 – Global Directory Service 88

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

OPC Unified Architecture - Part 7: Profiles

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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62541-7 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) Profiles and *ConformanceUnits* are not part of this document, but are solely managed in a public database as described in Clause 1.

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

Draft	Report on voting
65E/1184/FDIS	65E/1199/RVD

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 specifies value and structure of *Profiles* in the OPC Unified Architecture.

OPC UA *Profiles* are used to segregate features with regard to testing of OPC UA products and the nature of the testing. The scope of this document includes defining functionality that can only be tested. The definition of actual *TestCases* is not within the scope of this document, but the general categories of TestCases are covered by this document.

Most OPC UA applications will conform to several, but not all of the *Profiles*.

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 62541-4, *OPC Unified Architecture - Part 4: Services*

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

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

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

IEC 62541-9, *OPC Unified Architecture - Part 9: Alarms and Conditions*

IEC 62541-10, *OPC Unified Architecture - Part 10: Programs*

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

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

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

IEC 62541-14, *OPC Unified Architecture - Part 14: PubSub*

IEC 62541-15, *OPC Unified Architecture - Part 15: Safety*

IEC 62541-16, *OPC Unified Architecture - Part 16: State Machines*

IEC 62541-17, *OPC Unified Architecture - Part 17: Alias Names*

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

IEC 62541-19, *OPC Unified Architecture - Part 19: Dictionary Reference*

IEC 62541-20, *OPC Unified Architecture - Part 20: File Transfer*

IEC 62541-22, *OPC Unified Architecture - Part 22: Base Network Model*

IEC 62541-24, *OPC Unified Architecture - Part 24: Scheduler* [viewed 2025-08-18]

IEEE 802.1AS-2011, *IEEE Standard for Local and Metropolitan Area Networks - Timing and Synchronization for Time-Sensitive Applications in Bridged Local Area Networks*
https://ieeexplore.ieee.org/document/5741898 [viewed 2025-08-18]

IEEE 1588-2019, *IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems*
https://ieeexplore.ieee.org/document/9120376 [viewed 2025-08-18]

RFC 2104, HMAC: Keyed-Hashing for Message Authentication
https://datatracker.ietf.org/doc/html/rfc2104 [viewed 2025-08-18]

RFC 3174, US Secure Hash Algorithm 1 (SHA1)
https://datatracker.ietf.org/doc/html/rfc3174 [viewed 2025-08-18]

RFC 3686, Using Advanced Encryption Standard (AES) Counter Mode with IPsec Encapsulating Security Payload (ESP)
https://datatracker.ietf.org/doc/html/rfc3686 [viewed 2025-08-18]

RFC 3447, Public-Key Cryptography Standards (PKCS) #1: RSA Cryptography
https://datatracker.ietf.org/doc/html/rfc3447 [viewed 2025-08-18]

RFC 4634, US Secure Hash Algorithms (SHA and HMAC-SHA)
https://datatracker.ietf.org/doc/html/rfc4634 [viewed 2025-08-18]

RFC 5869, HMAC-based Extract-and-Expand Key Derivation Function (HKDF)
https://datatracker.ietf.org/doc/html/rfc5869 [viewed 2025-08-18]

RFC 6243, With-defaults Capability for NETCONF
https://datatracker.ietf.org/doc/html/rfc6243 [viewed 2025-08-18]

RFC 8439, ChaCha20 and Poly1305 for IETF Protocols
https://datatracker.ietf.org/doc/html/rfc8439 [viewed 2025-08-18]