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IEC 62541-6:2015, IDT
(ICS 25.040.40; 35.100)

SINGAPORE STANDARD

OPC unified architecture

– Part 6 : Mappings

Singapore Standards Council

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CONTENTS

NATIONAL FOREWORD 10
FOREWORD 11
1 Scope 13
2 Normative references 13
3 Terms, definitions, abbreviations and symbols 15
3.1 Terms and definitions 15
3.2 Abbreviations and symbols 15
4 Overview 16
5 Data encoding 17
5.1 General 17
5.1.1 Overview 17
5.1.2 Built-in Types 17
5.1.3 Guid 18
5.1.4 ByteString 19
5.1.5 ExtensionObject` 19
5.1.6 Variant 19
5.2 OPC UA Binary 20
5.2.1 General 20
5.2.2 Built-in Types 20
5.2.3 Enumerations 29
5.2.4 Arrays 29
5.2.5 Structures 29
5.2.6 Messages 30
5.3 XML 30
5.3.1 Built-in Types 30
5.3.2 Enumerations 37
5.3.3 Arrays 37
5.3.4 Structures 38
5.3.5 Messages 38
6 Message SecurityProtocols 38
6.1 Security handshake 38
6.2 Certificates 40
6.2.1 General 40
6.2.2 Application Instance Certificate 40
6.2.3 Signed Software Certificate 41
6.3 Time synchronization 42
6.4 UTC and International Atomic Time (TAI) 42
6.5 Issued User Identity Tokens – Kerberos 43
6.6 WS Secure Conversation 43
6.6.1 Overview 43
6.6.2 Notation 45
6.6.3 Request Security Token (RST/SCT) 45
6.6.4 Request Security Token Response (RSTR/SCT) 46

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6.6.5 Using the SCT 47
6.6.6 Cancelling Security contexts 47
6.7 OPC UA Secure Conversation 48
6.7.1 Overview 48
6.7.2 MessageChunk structure 48
6.7.3 MessageChunks and error handling 52
6.7.4 Establishing a SecureChannel 53
6.7.5 Deriving keys 54
6.7.6 Verifying Message Security 55
7 Transport Protocols 56
7.1 OPC UA TCP 56
7.1.1 Overview 56
7.1.2 Message structure 56
7.1.3 Establishing a connection 58
7.1.4 Closing a connection 59
7.1.5 Error handling 60
7.1.6 Error recovery 60
7.2 SOAP/HTTP 62
7.2.1 Overview 62
7.2.2 XML Encoding 62
7.2.3 OPC UA Binary Encoding 63
7.3 HTTPS 63
7.3.1 Overview 63
7.3.2 XML Encoding 65
7.3.3 OPC UA Binary Encoding 66
7.4 Well known addresses 66
8 Normative Contracts 67
8.1 OPC Binary Schema 67
8.2 XML Schema and WSDL 67
Annex A (normative) Constants 68
A.1 Attribute Ids 68
A.2 Status Codes 68
A.3 Numeric Node Ids 69
Annex B (normative) OPC UA Nodeset 70
Annex C (normative) Type declarations for the OPC UA native Mapping 71
Annex D (normative) WSDL for the XML Mapping 72
D.1 XML Schema 72
D.2 WDSL Port Types 72
D.3 WSDL Bindings 72
Annex E (normative) Security settings management 73
E.1 Overview 73
E.2 SecuredApplication 74
E.3 CertificateIdentifier 77
E.4 CertificateStoreIdentifier 79
E.5 CertificateList 80

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E.6 CertificateValidationOptions 80
Annex F (normative) Information Model XML Schema 81
F.1 Overview 81
F.2 UANodeSet 81
F.3 UANode 82
F.4 Reference 82
F.5 UAType 83
F.6 UAInstance 83
F.7 UAVariable 83
F.8 UAMethod 84
F.9 TranslationType 84
F.10 UADataType 85
F.11 DataTypeDefinition 86
F.12 DataTypeField 86
F.13 Variant 87
F.14 Example (Informative) 87

Figure 1 – The OPC UA Stack Overview 17
Figure 2 – Encoding Integers in a binary stream 20
Figure 3 – Encoding Floating Points in a binary stream 21
Figure 4 – Encoding Strings in a binary stream 21
Figure 5 – Encoding Guids in a binary stream 22
Figure 6 – Encoding XmlElements in a binary stream 23
Figure 7 – A String NodeId 24
Figure 8 – A Two Byte NodeId 24
Figure 9 – A Four Byte NodeId 25
Figure 10 – Security handshake 39
Figure 11 – Relevant XML Web Services specifications 44
Figure 12 – The WS Secure Conversation handshake 44
Figure 13 – OPC UA Secure Conversation MessageChunk 48
Figure 14 – OPC UA TCP Message structure 58
Figure 15 – Establishing a OPC UA TCP connection 59
Figure 16 – Closing a OPC UA TCP connection 59
Figure 17 – Recovering an OPC UA TCP connection 61
Figure 18 – Scenarios for the HTTPS Transport 64

Table 1 – Built-in Data Types 18
Table 2 – Guid structure 18
Table 3 – Supported Floating Point Types 21
Table 4 – NodeId components 23
Table 5 – NodeId DataEncoding values 23
Table 6 – Standard NodeId Binary DataEncoding 23

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Table 7 – Two Byte NodeId Binary DataEncoding 24
Table 8 – Four Byte NodeId Binary DataEncoding 24
Table 9 – ExpandedNodeId Binary DataEncoding 25
Table 10 – DiagnosticInfo Binary DataEncoding 26
Table 11 – QualifiedName Binary DataEncoding 26
Table 12 – LocalizedText Binary DataEncoding 26
Table 13 – Extension Object Binary DataEncoding 27
Table 14 – Variant Binary DataEncoding 28
Table 15 – Data Value Binary DataEncoding 29
Table 16 – Sample OPC UA Binary Encoded structure 30
Table 17 – XML Data Type Mappings for Integers 31
Table 18 – XML Data Type Mappings for Floating Points 31
Table 19 – Components of NodeId 33
Table 20 – Components of ExpandedNodeId 34
Table 21 – Components of Enumeration 37
Table 22 – SecurityPolicy 39
Table 23 – ApplicationInstanceCertificate 41
Table 24 – SignedSoftwareCertificate 42
Table 25 – Kerberos UserTokenPolicy 43
Table 26 – WS-* Namespace prefixes 45
Table 27 – RST/SCT Mapping to an OpenSecureChannel Request 46
Table 28 – RSTR/SCT Mapping to an OpenSecureChannel Response 47
Table 29 – OPC UA Secure Conversation Message header 49
Table 30 – Asymmetric algorithm Security header 50
Table 31 – Symmetric algorithm Security header 51
Table 32 – Sequence header 51
Table 33 – OPC UA Secure Conversation Message footer 51
Table 34 – OPC UA Secure Conversation Message abort body 52
Table 35 – OPC UA Secure Conversation OpenSecureChannel Service 53
Table 36 – Cryptography key generation parameters 54
Table 37 – OPC UA TCP Message header 56
Table 38 – OPC UA TCP Hello Message 57
Table 39 – OPC UA TCP Acknowledge Message 57
Table 40 – OPC UA TCP Error Message 58
Table 41 – OPC UA TCP error codes 60
Table 42 – WS-Addressing headers 62
Table 43 – Well known addresses for Local Discovery Servers 66
Table A.1 – Identifiers assigned to Attributes 68
Table E.1 – SecuredApplication 75
Table E.2 – CertificateIdentifier 78

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Table E.3 – Structured directory store 79
Table E.4 – CertificateStoreIdentfier 79
Table E.5 – CertificateList 80
Table E.6 – CertificateValidationOptions 80
Table F.1 – UANodeSet 81
Table F.2 – UANode 82
Table F.3 – Reference 83
Table F.4 – UANodeSet Type Nodes 83
Table F.5 – UANodeSet Instance Nodes 83
Table F.6 – UAInstance 83
Table F.7 – UAVariable 84
Table F.8 – UAMethod 84
Table F.9 – TranslationType 85
Table F.10 – UADataType 86
Table F.11 – DataTypeDefinition 86
Table F.12 – DataTypeField 87

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National Foreword

This Singapore Standard was prepared by the Working Group on Smart Manufacturing Readiness Level set up by the Technical Committee on Smart Manufacturing under the purview of MSC.

This standard is identical with IEC 62541-6:2015, “OPC unified architecture – Part 6: Mappings”, published by the International Electrotechnical Commission.

NOTE 1 – Reference to International Standards are replaced by applicable Singapore Standards and Technical References.

NOTE 2 – Where numerical values are expressed as decimals, the comma is read as a full point.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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OPC UNIFIED ARCHITECTURE –

Part 6: Mappings

FOREWORD

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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 second edition cancels and replaces the first edition published in 2011. This edition constitutes a technical revision.

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

a) Some applications need to operation in environments with no access to cryptography libraries. To support this a new HTTPS transport has been defined in 7.3;
b) The padding byte is not long enough to handle asymmetric key sizes larger than 2048 bits. Added an additional padding byte to 6.7.2 to handle this case.

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c) Fixed errors in SOAP action URIs defined in 7.2.2;

d) Needed a standard way to serialize nodes in an address space. Added the UANodeSet schema defined in Annex F;

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

CDV	Report on voting
65E/377/CDV	65E/405/RVC

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

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

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 publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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OPC UNIFIED ARCHITECTURE –

Part 6: Mappings

1 Scope

This part of IEC 62541 specifies the OPC Unified Architecture (OPC UA) mapping between the security model described in IEC TR 62541-2, the abstract service definitions, described in IEC 62541-4, the data structures defined in IEC 62541-5 and the physical network protocols that can be used to implement the OPC UA specification.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 62541-4*, 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*

XML Schema Part 1: XML Schema Part 1: Structures

http://www.w3.org/TR/xmlschema-1/

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/

SOAP Part 2: SOAP Version 1.2 Part 2: Adjuncts

http://www.w3.org/TR/soap12-part2/

XML Encryption: XML Encryption Syntax and Processing

http://www.w3.org/TR/xmlenc-core/

XML Signature: XML-Signature Syntax and Processing

http://www.w3.org/TR/xmldsig-core/

WS Security: SOAP Message Security 1.1

http://www.oasis-open.org/committees/download.php/16790/wss-v1.1-spec-os-SOAPMessageSecurity.pdf

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WS Addressing: Web Services Addressing (WS-Addressing)
http://www.w3.org/Submission/ws-addressing/

WS Trust: WS Trust 1.3
http://docs.oasis-open.org/ws-sx/ws-trust/v1.3/ws-trust.html

WS Secure Conversation: WS Secure Conversation 1.3
http://docs.oasis-open.org/ws-sx/ws-secureconversation/v1.3/ws-secureconversation.html

WS Security Policy: WS Security Policy 1.2
http://docs.oasis-open.org/ws-sx/ws-securitypolicy/200702/ws-securitypolicy-1.2-spec-os.html

SSL/TLS: RFC 5246 – The TLS Protocol Version 1.2
http://tools.ietf.org/html/rfc5246.txt

X509: X.509 Public Key Certificate Infrastructure
http://www.itu.int/rec/T-REC-X.509-200003-I/e

WS-I Basic Profile 1.1: WS-I Basic Profile Version 1.1
http://www.ws-i.org/Profiles/BasicProfile-1.1.html

WS-I Basic Security Profile 1.1: WS-I Basic Security Profile Version 1.1
http://www.ws-i.org/Profiles/BasicSecurityProfile-1.1.html

HTTP: RFC 2616 – Hypertext Transfer Protocol – HTTP/1.1
http://www.ietf.org/rfc/rfc2616.txt

Base64: RFC 3548 – The Base16, Base32, and Base64 Data Encodings
http://www.ietf.org/rfc/rfc3548.txt

X690: ITU-T X.690 – Basic (BER), Canonical (CER) and Distinguished (DER) Encoding Rules
http://www.itu.int/ITU-T/studygroups/com17/languages/X.690-0207.pdf

IEEE-754: Standard for Binary Floating-Point Arithmetic
http://grouper.ieee.org/groups/754/

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

FIPS 180-2: Secure Hash Standard (SHA)
http://csrc.nist.gov/publications/fips/fips180-2/fips180-2.pdf

FIPS 197: Advanced Encyption Standard (AES)
http://www.csrc.nist.gov/publications/fips/fips197/fips-197.pdf

UTF8: UTF-8, a transformation format of ISO 10646
http://tools.ietf.org/html/rfc3629

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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)
http://www.ietf.org/rfc/rfc1305.txt

Kerberos: WS Security Kerberos Token Profile 1.1
http://docs.oasis-open.org/wss/v1.1/wss-v1.1-spec-os-KerberosTokenProfile.pdf

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