

<b>STN</b>	<b>Riadenie elektrických výkonových sústav a pridružená výmena informácií Bezpečnosť údajov a komunikácií Časť 4: Profily zahŕňajúce MMS a deriváty</b>	<b>STN EN IEC 62351-4</b>  33 4622
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Power systems management and associated information exchange - Data and communications security - Part 4: Profiles including MMS and derivatives

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 06/19

Obsahuje: EN IEC 62351-4:2018, IEC 62351-4:2018

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Power systems management and associated information  
exchange - Data and communications security - Part 4: Profiles  
including MMS and derivatives  
(IEC 62351-4:2018)

Gestion des systèmes de puissance et échanges  
d'informations associés - Sécurité des communications et  
des données - Partie 4 : Profils comprenant MMS  
(IEC 62351-4:2018)

Energiemanagementsysteme und zugehöriger  
Datenaustausch - IT-Sicherheit für Daten und  
Kommunikation - Teil 4: Profile einschließlich MMS und  
Ableitungen  
(IEC 62351-4:2018)

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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN IEC 62351-4:2018 (E)****European foreword**

The text of document 57/2032/FDIS, future edition 1 of IEC 62351-4, prepared by IEC/TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62351-4:2018.

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) 2019-09-20
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-12-20

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60870-6-503:2014	NOTE	Harmonized as EN 60870-6-503:2014 (not modified)
IEC 60870-6-702:2014	NOTE	Harmonized as EN 60870-6-702:2014 (not modified)
IEC 60870-6-802:2014	NOTE	Harmonized as EN 60870-6-802:2014 (not modified)

## 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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC/TS 62351-1	-	Power systems management and associated information exchange - Data and communications security - Part 1: Communication network and system security - Introduction to security issues	-	-
IEC/TS 62351-2	-	Power systems management and associated information exchange - Data and communications security - Part 2: Glossary of terms	-	-
IEC 62351-3	2014	Power systems management and associated information exchange - Data and communications security - Part 3: Communication network and system security - Profiles including TCP/IP	EN 62351-3	2014
+A1	2018		+A1	2018
IEC/TS 62351-8	2011	Power systems management and associated information exchange - Data and communications security - Part 8: Role-based access control	-	-
IEC 62351-9	2017	Power systems management and associated information exchange - Data and communications security - Part 9: Cyber security key management for power system equipment	EN 62351-9	2017
ISO/IEC 8073	1997	Information technology - Open Systems Interconnection - Protocol for providing the connection-mode transport service	-	-
ISO/IEC 8823-1	1994	Information technology - Open Systems Interconnection - Connection-oriented presentation protocol: Protocol specification	-	-
ISO/IEC 8824-1	-	Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation	-	-

**EN IEC 62351-4:2018 (E)**

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)	-	-
ISO/IEC 8825-4	-	Information technology - ASN.1 encoding rules: XML Encoding Rules (XER)	-	-
ISO 8601	2004	Data elements and interchange formats - Information interchange - Representation of dates and times	-	-
ISO 9506-2	2003	Industrial automation systems - Manufacturing Message Specification - Part 2: Protocol specification	-	-
ISO/IEC 9594-8	-	Information technology - Open Systems Interconnection - The Directory - Part 8: Public-key and attribute certificate frameworks	-	-
ITU-T Recommendation X.227	-	Information technology - Open Systems Interconnection - Connection-oriented protocol for the Association Control Service Element: Protocol specification	-	-
+ A1	-		-	-
IETF RFC 1006	1987	ISO Transport Service on top of the TCP, Version: 3	-	-
IETF RFC 2104	1997	HMAC: Keyed-Hashing for Message Authentication	-	-
IETF RFC 3526	2003	More Modular Exponential (MODP) Diffie-Hellman groups for Internet Key Exchange (IKE)	-	-
IETF RFC 5114	2003	Additional Diffie-Hellman Groups for Use with IETF Standards	-	-
IETF RFC 5246	2008	The Transport Layer Security (TLS) Protocol Version 1.2	-	-
IETF RFC 5480	2009	Elliptic Curve Cryptography Subject Public Key Information	-	-
IETF RFC 5639	2010	Elliptic Curve Cryptography (ECC) Brainpool Standard Curves and Curve Generation	-	-
IETF RFC 5869	2010	HMAC-based Extract-and-Expand Key Derivation Function	-	-
IETF RFC 6120	2011	Extensible Messaging and Presence Protocol (XMPP): Core	-	-
IETF RFC 6122	2011	Extensible Messaging and Presence Protocol (XMPP): Address Format	-	-



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# INTERNATIONAL STANDARD



**Power systems management and associated information exchange – Data and communications security –  
Part 4: Profiles including MMS and derivatives**





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IEC 62351-4

Edition 1.0 2018-11

# INTERNATIONAL STANDARD



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**Power systems management and associated information exchange – Data and communications security –  
Part 4: Profiles including MMS and derivatives**

INTERNATIONAL  
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## CONTENTS

FOREWORD.....	8
1 Scope.....	10
1.1 General.....	10
1.2 Code components.....	11
2 Normative references.....	11
3 Terms, definitions and abbreviated terms.....	12
3.1 General.....	12
3.2 Terms and definitions.....	13
3.3 Abbreviated terms.....	16
4 Security issues addressed by this part of IEC 62351.....	17
4.1 Communications reference models.....	17
4.2 Security for application and transport profiles.....	18
4.3 Compatibility and native modes.....	19
4.4 Security threats countered.....	19
4.4.1 General.....	19
4.4.2 Threats countered in compatibility mode.....	20
4.4.3 Threats countered in native mode.....	20
4.5 Attack methods countered.....	20
4.5.1 General.....	20
4.5.2 Attacks countered in compatibility mode.....	20
4.5.3 Attacks countered in native mode.....	20
4.6 Logging.....	21
5 Specific requirements.....	21
5.1 Specific requirements for ICCP/IEC 60870-6-x communication stack.....	21
5.2 Specific requirements for IEC 61850.....	22
6 Transport Security.....	22
6.1 General.....	22
6.2 Application of transport layer security (TLS).....	22
6.2.1 General.....	22
6.2.2 The TLS cipher suite concept.....	23
6.2.3 TLS session resumption.....	23
6.2.4 TLS session renegotiation.....	23
6.2.5 Supported number of trust anchors.....	23
6.2.6 Public-key certificate size.....	23
6.2.7 Evaluation period for revocation state of public-key certificates.....	23
6.2.8 Public-key certificate validation.....	24
6.2.9 Security events handling.....	24
6.3 T-security in an OSI operational environment.....	24
6.3.1 General.....	24
6.3.2 TCP ports.....	24
6.3.3 Disabling of TLS.....	25
6.3.4 TLS cipher suites support.....	25
6.4 T-security in an XMPP operational environment.....	26
7 Application layer security overview (informative).....	26
7.1 General.....	26
7.2 Description techniques.....	27

7.2.1	General .....	27
7.2.2	ASN.1 as an XML schema definition .....	27
7.2.3	W3C XML Schema Definition (W3C XSD) .....	28
7.2.4	XML namespace .....	28
8	Use of cryptographic algorithms .....	28
8.1	General.....	28
8.2	Basic cryptographic definitions.....	28
8.3	Public-key algorithms.....	29
8.4	Hash algorithms.....	30
8.5	Signature algorithms.....	30
8.6	Symmetric encryption algorithms used for encryption only .....	30
8.7	Authenticated encryption algorithms .....	31
8.8	Integrity check value algorithms.....	31
9	Object identifier allocation (normative).....	32
10	General OSI upper layer requirements (normative) .....	32
10.1	Overview.....	32
10.2	General on OSI upper layer requirements .....	33
10.3	Session protocol requirements.....	33
10.4	Presentation protocol requirements.....	34
10.4.1	Context list .....	34
10.4.2	Abstract syntaxes .....	34
10.4.3	Presentation user data.....	34
10.4.4	ASN.1 encoding requirements .....	35
10.5	Association control service element (ACSE) protocol requirements .....	36
10.5.1	General .....	36
10.5.2	Protocol version.....	36
10.5.3	Titles .....	36
10.5.4	Use of ASN.1 EXTERNAL data type .....	36
11	A-security-profile (normative).....	37
11.1	OSI requirements specific to A-security profile .....	37
11.1.1	General .....	37
11.1.2	Additional session protocol requirements.....	37
11.1.3	Additional presentation protocol requirement .....	37
11.1.4	Additional ACSE requirements.....	37
11.2	MMS Authentication value.....	39
11.2.1	General .....	39
11.2.2	MMS-Authentication value data type.....	39
11.2.3	Handling of the association request (AARQ-apdu) .....	40
11.2.4	Handling of the association result (AARE-apdu).....	40
12	End-to-end application security model .....	41
12.1	Introduction and general architecture .....	41
12.2	Abstract syntax specifications .....	42
12.2.1	General .....	42
13	End-to-end application security (normative) .....	43
13.1	Association management .....	43
13.1.1	General concept .....	43
13.1.2	UTC time specification.....	43
13.1.3	Handshake request.....	43

13.1.4	Handshake accept .....	44
13.1.5	Association reject by the protected protocol .....	45
13.1.6	Association reject due to security issues .....	45
13.1.7	Handshake security abort .....	46
13.1.8	Data transfer security abort .....	46
13.1.9	Abort by protected protocol .....	46
13.1.10	Association release request .....	47
13.1.11	Association release response .....	47
13.2	Data transfer phase .....	47
13.2.1	General .....	47
13.2.2	Clear data transfer .....	48
13.2.3	Encrypted data transfer .....	48
13.3	ClearToken data types .....	49
13.3.1	The ClearToken1 data type .....	49
13.3.2	The ClearToken2 data type .....	53
13.3.3	The ClearToken3 data type .....	54
13.4	Authentication and integrity specifications .....	55
13.4.1	The Signature data type .....	55
13.4.2	The authenticator data type .....	55
14	E2E security error handling (normative) .....	56
14.1	General .....	56
14.2	Specification of diagnostics .....	56
14.2.1	Handshake diagnostics .....	56
14.2.2	The data transfer diagnostics .....	57
14.3	Checking of E2E-security handshake request and accept .....	58
14.3.1	General .....	58
14.3.2	Signature checking .....	58
14.3.3	Protected protocol identity checking .....	59
14.3.4	ClearToken1 checking .....	59
14.4	Checking of security protocol control information during data transfer .....	60
14.4.1	General .....	60
14.4.2	Authenticator checking .....	60
14.4.3	Checks of the ClearToken2 value .....	60
15	E2E security used in an OSI operational environment .....	61
15.1	General .....	61
15.2	Additional upper layer requirements .....	61
15.2.1	Additional presentation layer requirements .....	61
15.2.2	Additional ACSE requirements .....	61
15.3	Association management in an OSI operational environment .....	62
15.3.1	General .....	62
15.3.2	Mapping to ACSE association request .....	62
15.3.3	Mapping to ACSE association response .....	62
15.3.4	Mapping to ACSE abort .....	63
15.3.5	Mapping to ACSE release request .....	64
15.3.6	Mapping to ACSE release response .....	64
15.4	Data transfer in OSI operational environment .....	64
15.4.1	General .....	64
15.4.2	Mapping of the clear data transfer SecPDU .....	64
15.4.3	Mapping of the encrypted data transfer SecPDU .....	65

15.5	OSI upper layer routing .....	65
15.6	OSI operational environment checking .....	66
15.6.1	General checking .....	66
15.6.2	Environment mapping checking .....	66
15.6.3	OSI operational environment diagnostics .....	67
16	E2E security used in in an XMPP operational environment .....	67
16.1	General on wrapping to an XMPP operational environment .....	67
16.2	Mapping of SecPDUs to iq stanzas .....	68
16.3	Mapping of SecPDUs to message stanzas .....	69
16.4	XMPP stanza error handling .....	69
16.5	XML namespaces .....	70
16.6	Encoding of EnvPDUs within XMPP stanzas .....	70
16.7	Multiple associations .....	71
16.8	Release collision consideration .....	71
17	Conformance to this document .....	71
17.1	General .....	71
17.2	Notation .....	71
17.3	Conformance to operational environment .....	71
17.4	Conformance to modes of operation .....	72
17.5	Conformance to compatibility mode .....	72
17.6	Conformance to native mode .....	73
Annex A	(normative) Formal ASN.1 specification for the A-security-profile .....	75
Annex B	(normative) Formal ASN.1 specification for the End-to-End security .....	76
Annex C	(normative) Formal W3C XSD specification for the end-to-end security .....	82
Annex D	(normative) ASN.1 module for OSI operational environment .....	89
D.1	Scope of annex .....	89
D.2	ASN.1 module .....	89
Annex E	(normative) ASN.1 modules and W3C XSDs for an XMPP operational environment .....	91
E.1	Scope of Annex .....	91
E.2	ASN.1 modules for the XMPP operational environment .....	91
E.2.1	ASN.1 module for the urn:ietf:params:xml:ns:xmpp-stanzas XML namespace .....	91
E.2.2	ASN.1 module for the http://www.iec.ch/62351/2018/ENV_4 XML namespace .....	91
E.3	W3C XSDs for the XMPP operational environment .....	93
E.3.1	W3C XSD for the urn:ietf:params:xml:ns:xmpp-stanzas XML namespace .....	93
E.3.2	W3C XSD for the http://www.iec.ch/62351/2018/ENV_4 XML namespace .....	94
Annex F	(normative) Template for virtual API specifications .....	96
F.1	General .....	96
F.2	ASN.1 virtual API specification .....	97
F.3	W3C XSD virtual API specification .....	97
Annex G	(normative) End-entity public-key certificate specification .....	98
G.1	Scope of annex .....	98
G.2	General requirement .....	98
G.3	Length considerations .....	98
G.4	Basic Structure requirement and recommendations .....	98
G.4.1	Version component .....	98

G.4.2	Serial number component .....	98
G.4.3	Issuer signature algorithm component .....	98
G.4.4	Issuer component .....	99
G.4.5	Validity component .....	99
G.4.6	Subject component .....	99
G.4.7	Subject public key Information component .....	99
G.4.8	Issuer unique ID and subject unique ID components .....	100
G.5	Extensions .....	100
G.5.1	General .....	100
G.5.2	Key usage extension .....	100
G.5.3	Revocation checking .....	100
G.5.4	IEC user role information extension .....	101
G.6	Specific requirements for operational environments .....	101
G.6.1	General .....	101
G.6.2	OSI operational environment .....	101
G.6.3	XMPP operational environment .....	101
Annex H (normative)	Lower layer requirements for the OSI operational environment .....	102
H.1	Scope of annex .....	102
H.2	Transport protocol class 0 .....	102
H.2.1	Enforcement of maximum lengths .....	102
H.2.2	Response to Class 0 unsupported TPDU's .....	102
H.2.3	Transport selectors .....	102
H.3	IETF RFC 1006 .....	103
H.3.1	General .....	103
H.3.2	Version number .....	103
H.3.3	Length .....	103
H.3.4	Keep-alive .....	103
Annex I (informative)	ASN.1 definition of ACSE .....	104
Bibliography	.....	108
Figure 1	– Application and transport profiles (informative) .....	18
Figure 2	– T-profiles without and with TLS protection .....	24
Figure 3	– Association establishment .....	33
Figure 4	– Inclusion of User-data in SESSION DATA TRANSFER SPDU .....	35
Figure 5	– E2E security building blocks .....	41
Figure 6	– Relationship between environment, E2E-security and protected protocol .....	41
Figure 7	– Relationships between APDU's .....	42
Figure 8	– The scope of E2E-security specification .....	42
Figure 9	– Upper layer routing .....	65
Figure F.1	– Virtual API concept .....	96
Table 1	– Relationship between security and security measure combinations .....	19
Table 2	– Commented recommended cipher suites from IEC TS 62351-4:2007 .....	25
Table 3	– Cipher suites combinations in the context of this document .....	26
Table 4	– Mapping of SecPDUs to ACSE APDU's .....	62
Table 5	– Mapping of SecPDUs to XMPP stanzas .....	68

Table 6 – Conformance to operational environment .....	72
Table 7 – Conformance to modes of operation .....	72
Table 8 – Conformance to compatibility mode .....	72
Table 9 – Conformance to TLS cipher suites in compatibility mode .....	73
Table 10 – Conformance to native mode .....	73
Table 11 – Conformance to mode of encryption .....	73
Table 12 – Conformance to TLS cipher suites in native mode .....	74
Table 13 – Conformance to cryptographic algorithms for E2E-security .....	74
Table H.1 – TP class 0 maximum sizes .....	102

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**POWER SYSTEMS MANAGEMENT AND  
ASSOCIATED INFORMATION EXCHANGE –  
DATA AND COMMUNICATIONS SECURITY –**

**Part 4: Profiles including MMS and derivatives**

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International Standard IEC 62351-4 has been prepared by IEC technical committee 57: Power systems management and associated exchange.

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

FDIS	Report on voting
57/2032/FDIS	57/2053/RVD

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 in the IEC 62351 series, published under the general title *Power systems management and associated information exchange – Data and communications security*, can be found on the IEC website.

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- Abstract Syntax Notation One (ASN.1) and W3C XML Schema Definition (W3C XSD) notions are presented in **Courier New** typeface; and
- when ASN.1 types and values are referenced in normal text, they are differentiated from normal text by presenting them in **Courier New** typeface.

A list of all parts in the IEC 62351 series, published under the general title *Power systems management and associated information exchange – Data and communications security*, 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.

A bilingual version of this publication may be issued at a later date.

**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.**



# **POWER SYSTEMS MANAGEMENT AND ASSOCIATED INFORMATION EXCHANGE – DATA AND COMMUNICATIONS SECURITY –**

## **Part 4: Profiles including MMS and derivatives**

### **1 Scope**

#### **1.1 General**

This part of IEC 62351 extends the scope of IEC TS 62351-4:2007 [1]<sup>1</sup> by specifying a compatibility mode that provides interoperability with implementation based on IEC TS 62351-4:2007 and by specifying extended capabilities referred to as native mode.

This part of IEC 62351 specifies security requirements both at the transport layer and at the application layer. While IEC TS 62351-4:2007 primarily provided some limited support at the application layer for authentication during handshake for the Manufacturing Message Specification (MMS) based applications, this document also provides support for extended integrity and authentication both for the handshake phase and for the data transfer phase. It provides for shared key management and data transfer encryption at the application layer and it provides security end-to-end (E2E) with zero or more intermediate entities. While IEC TS 62351-4:2007 only provides support for systems based on the MMS, i.e. systems using an Open Systems Interworking (OSI) protocol stack, this document also provides support for application protocols using other protocol stacks, e.g. an Internet protocol suite (see 4.1). This support is extended to protect application protocols using XML encoding. This extended security at the application layer is referred to as E2E-security.

In addition to E2E security, this part of IEC 62351 also provides mapping to environmental protocols carrying the security related information. Only OSI and XMPP environments are currently considered.

It is intended that this part of IEC 62351 be referenced as a normative part of standards that have a need for using application protocols, e.g., MMS, in a secure manner.

It is anticipated that there are implementations, in particular Inter-Control Centre Communications Protocol (ICCP) implementations that are dependent on the IEC TS 62351-4:2007 specifications of the T-profile and the A-security-profile. The specifications from IEC TS 62351-4:2007 are therefore included in this part of IEC 62351. Implementations supporting these specifications will interwork with implementation based on IEC TS 62351-4:2007.

**NOTE** The A-security-profile is in the strict sense not a profile, but the term is here kept for historical reasons.

This document represents a set of mandatory and optional security specifications to be implemented to protect application protocols.

The initial audience for this document is the members of the working groups developing or making use of protocols. For the measures described in this part of IEC 62351 to take effect, they shall be accepted and referenced by the specifications for the protocols themselves.

The subsequent audience for this document is the developers of products that implement these protocols and the end user that want to specify requirements for its own environment.

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<sup>1</sup> Numbers in square brackets refer to the bibliography.

Portions of this document may also be of use to managers and executives in order to understand the purpose and requirements of the work.

## 1.2 Code components

The purchase of this IEC standard carries a copyright license for the purchaser to sell software containing Code Components from this standard to end users either directly or via distributors, subject to IEC software licensing conditions, which can be found at: [www.iec.ch/CCv1](http://www.iec.ch/CCv1).

The Code Components included in this IEC standard are also available as electronic machine readable file at: [www.iec.ch/public/tc57/supportdocuments/IEC\\_62351-4.ASN.1\\_XSD.full.zip](http://www.iec.ch/public/tc57/supportdocuments/IEC_62351-4.ASN.1_XSD.full.zip)

In this document, code components are contained within Annexes A, B, C, D and E.

## 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 TS 62351-1, *Power systems management and associated information exchange – Data and communications security – Part 1: Communication network and system security – Introduction to security issues*

IEC TS 62351-2, *Power systems management and associated information exchange – Data and communications security – Part 2: Glossary of terms*

IEC 62351-3:2014, *Power systems management and associated information exchange – Data and communications security – Part 3: Communication network and system security – Profiles including TCP/IP*

IEC 62351-3:2014/AMD1:2018

IEC TS 62351-8:2011, *Power systems management and associated information exchange – Data and communications security – Part 8: Role-based access control*

IEC 62351-9:2017, *Power systems management and associated information exchange – Data and communications security – Part 9: Cyber security key management for power system equipment*

ISO/IEC 8073:1997 | Rec. ITU-T X.224 (1995), *Information technology – open systems interconnection – Protocol for providing the connection-mode transport service*

ISO/IEC 8823-1:1994 | Rec. ITU-T X.226 (1994), *Information technology – open systems interconnection – connection-oriented presentation protocol: Protocol specification*

ISO/IEC 8824-1 | Rec. ITU-T X.680, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation*

ISO/IEC 8825-1 | Rec. ITU-T X.690, *Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*

ISO/IEC 8825-4 | Rec. ITU-T X.693, *Information technology – ASN.1 encoding rules: XML Encoding Rules (XER)*

ISO 8601:2004, *Data elements and interchange formats – Information interchange – Representation of dates and times*

ISO 9506-2:2003, *Industrial automation systems – Manufacturing Message Specification – Part 2: Protocol specification*

ISO/IEC 9594-8: | Rec. ITU-T X.509, *Information technology – Open Systems Interconnection – The Directory: Public-key and attribute certificate frameworks*

Rec. ITU-T X.227 (1995), *Information technology – open systems interconnection – connection-oriented protocol for the association control service element: Protocol specification*

NOTE 1 The corresponding International Standard ISO/IEC 8650-1:1996 has been withdrawn.

Rec. ITU-T X.227 (1995)/Amd.1 (1996), *Information technology – open systems interconnection – connection-oriented protocol for the association control service element: Protocol specification – Amendment 1: Incorporation of extensibility markers*

NOTE 2 The corresponding International Standard amendment ISO/IEC 8650-1:1996/Amd.1:1997 has been withdrawn.

IETF RFC 1006:1987, *ISO Transport Service on top of the TCP, Version: 3*

IETF RFC 2104:1997, *HMAC: Keyed-Hashing for Message Authentication*

IETF RFC 3526:2003, *More Modular Exponential (MODP) Diffie-Hellman groups for Internet Key Exchange (IKE)*

IETF RFC 5114:2008, *Additional Diffie-Hellman Groups for Use with IETF Standards*

IETF RFC 5246:2008, *The Transport Layer Security (TLS) Protocol, Version 1.2*

IETF RFC 5480:2009, *Elliptic Curve Cryptography Subject Public Key Information*

IETF RFC 5639:2010, *Elliptic Curve Cryptography (ECC) Brainpool Standard Curves and Curve Generation*

IETF RFC 5869:2010, *HMAC-based Extract-and-Expand Key Derivation Function*

IETF RFC 6120:2011, *Extensible Messaging and Presence Protocol (XMPP): Core*

IETF RFC 6122:2011, *Extensible Messaging and Presence Protocol (XMPP): Address Format*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**