



**NSAI**  
Standards

Irish Standard  
I.S. EN 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

**I.S. EN 62351-3:2014**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

*This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):*

*NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.*

*This document is based on:*

EN 62351-3:2014

*Published:*

2014-12-12

*This document was published under the authority of the NSAI and comes into effect on:*

2015-01-16

ICS number:

NOTE: If blank see CEN/CENELEC cover page

NSAI  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

Sales:  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

**EN 62351-3**

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2014

ICS 33.200

English Version

**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)**

Gestion des systèmes de puissance et échanges  
d'informations associés - Sécurité des communications et  
des données - Partie 3: Sécurité des réseaux et des  
systèmes de communication - Profils comprenant TCP/IP  
(CEI 62351-3:2014)

Management von Systemen der Energietechnik und  
zugehöriger Datenaustausch - Daten- und  
Kommunikationssicherheit - Teil 3: Sicherheit von  
Kommunikationsnetzen und Systemen - Profile  
einschließlich TCP/IP  
(IEC 62351-3:2014)

This European Standard was approved by CENELEC on 2014-12-02. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## **Foreword**

The text of document 57/1498/FDIS, future edition 1 of IEC 62351-3, 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 62351-3:2014.

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) 2015-09-02
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-12-02

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

## **Endorsement notice**

The text of the International Standard IEC 62351-3:2014 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, 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.

NOTE 1 When 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	2007	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	2008	Power systems management and associated information exchange - Data and communications security - Part 2: Glossary of terms	-	-
IEC/TS 62351-9	- <sup>1)</sup>	Power systems management and associated information exchange - Data and communications security - Part 9: Key management	-	-
ISO/IEC 9594-8	-	Information technology - Open Systems Interconnection - The Directory - Part 8: Public-key and attribute certificate frameworks	-	-
RFC 4492	2006	Elliptic Curve Cryptography (ECC) Cipher Suites for Transport Layer Security (TLS)	-	-
RFC 5246	2008	The Transport Layer Security (TLS) Protocol Version 1.2	-	-
RFC 5280	2008	Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile	-	-
RFC 5746	2010	Transport Layer Security (TLS) Renegotiation Indication Extension	-	-
RFC 6066	2011 <sup>2)</sup>	Transport Layer Security (TLS) Extensions: Extension Definitions	-	-
RFC 6176	2011	Prohibiting Secure Sockets Layer (SSL) Version 2.0	-	-

---

<sup>1)</sup> At draft stage.

<sup>2)</sup> Supersedes RFC 4366:2006, *Transport Layer Security (TLS) Extensions*.

This page is intentionally left blank



**IEC 62351-3**

Edition 1.0 2014-10

# **INTERNATIONAL STANDARD**

# **NORME INTERNATIONALE**

---

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

**Gestion des systèmes de puissance et échanges d'informations associés –  
Sécurité des communications et des données –  
Partie 3: Sécurité des réseaux et des systèmes de communication – Profils  
comprenant TCP/IP**





**THIS PUBLICATION IS COPYRIGHT PROTECTED**  
**Copyright © 2014 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office  
 3, rue de Varembe  
 CH-1211 Geneva 20  
 Switzerland

Tel.: +41 22 919 02 11  
 Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

#### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

#### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

#### IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

#### IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 14 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)

More than 55 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [csc@iec.ch](mailto:csc@iec.ch).

#### A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

#### A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

#### Catalogue IEC - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

#### Recherche de publications IEC - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 14 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

#### Glossaire IEC - [std.iec.ch/glossary](http://std.iec.ch/glossary)

Plus de 55 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

#### Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [csc@iec.ch](mailto:csc@iec.ch).





**IEC 62351-3**

Edition 1.0 2014-10

# **INTERNATIONAL STANDARD**

# **NORME INTERNATIONALE**

---

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

**Gestion des systèmes de puissance et échanges d'informations associés –  
Sécurité des communications et des données –  
Partie 3: Sécurité des réseaux et des systèmes de communication – Profils  
comprenant TCP/IP**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

PRICE CODE  
CODE PRIX

**N**

---

ICS 33.200

ISBN 978-2-8322-1900-3

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD .....	3
1 Scope .....	5
1.1 Scope .....	5
1.2 Intended Audience .....	5
2 Normative references .....	5
3 Terms, definitions and abbreviations .....	6
3.1 Terms, definitions and abbreviations .....	6
3.2 Additional abbreviations .....	6
4 Security issues addressed by this standard .....	6
4.1 Operational requirements affecting the use of TLS in the telecontrol environment .....	6
4.2 Security threats countered .....	7
4.3 Attack methods countered .....	7
5 Mandatory requirements .....	7
5.1 Deprecation of cipher suites .....	7
5.2 Negotiation of versions .....	8
5.3 Session resumption .....	8
5.4 Session renegotiation .....	8
5.5 Message Authentication Code .....	9
5.6 Certificate support .....	9
5.6.1 Multiple Certification Authorities (CAs) .....	9
5.6.2 Certificate size .....	10
5.6.3 Certificate exchange .....	10
5.6.4 Public-key certificate validation .....	10
5.7 Co-existence with non-secure protocol traffic .....	12
6 Optional security measure support .....	12
7 Referencing standard requirements .....	12
8 Conformance .....	13
Bibliography .....	14

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

**POWER SYSTEMS MANAGEMENT AND ASSOCIATED INFORMATION  
EXCHANGE – DATA AND COMMUNICATIONS SECURITY –**
**Part 3: Communication network and system security –  
Profiles including TCP/IP**

## 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) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62351-3 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This standard cancels and replaces IEC TS 62351-3:2007.

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

FDIS	Report on voting
57/1498/FDIS	57/1515/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.

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.

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

### Part 3: Communication network and system security – Profiles including TCP/IP

#### 1 Scope

##### 1.1 Scope

This part of IEC 62351 specifies how to provide confidentiality, integrity protection, and message level authentication for SCADA and telecontrol protocols that make use of TCP/IP as a message transport layer when cyber-security is required.

Although there are many possible solutions to secure TCP/IP, the particular scope of this part is to provide security between communicating entities at either end of a TCP/IP connection within the end communicating entities. The use and specification of intervening external security devices (e.g. “bump-in-the-wire”) are considered out-of-scope.

This part of IEC 62351 specifies how to secure TCP/IP-based protocols through constraints on the specification of the messages, procedures, and algorithms of Transport Layer Security (TLS) (defined in RFC 5246) so that they are applicable to the telecontrol environment of the IEC. TLS is applied to protect the TCP communication. It is intended that this standard be referenced as a normative part of other IEC standards that have the need for providing security for their TCP/IP-based protocol. However, it is up to the individual protocol security initiatives to decide if this standard is to be referenced.

This part of IEC 62351 reflects the security requirements of the IEC power systems management protocols. Should other standards bring forward new requirements, this standard may need to be revised.

##### 1.2 Intended Audience

The initial audience for this specification is intended to be experts developing or making use of IEC protocols in the field of power systems management and associated information exchange. For the measures described in this specification to take effect, they must be accepted and referenced by the specifications for the protocols themselves, where the protocols make use of TCP/IP security. This document is written to enable that process.

The subsequent audience for this specification is intended to be the developers of products that implement these protocols.

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

#### 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 TS 62351-1:2007, *Power systems management and associated information exchange – Data and communications security – Part 1: Communication network and system security – Introduction to security issues*

IEC TS 62351-2:2008, *Power systems management and associated information exchange – Data and communications security – Part 2: Glossary of terms*

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-