PD ISO/IEC TR 20004:2015

BSI Standards Publication

Information technology — Security techniques — Refining software vulnerability analysis under ISO/IEC 15408 and ISO/IEC 18045

bsi.

...making excellence a habit.™

Document Sharing Hub

Full document details: PD ISO/IEC TR 20004:2015

National foreword

This Published Document is the UK implementation of ISO/IEC TR 20004:2015. It supersedes PD ISO/IEC TR 20004:2012 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee IST/33, IT - Security techniques, to Subcommittee IST/33/3, Security Evaluation, Testing and Specification.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2016.
Published by BSI Standards Limited 2016

ISBN 978 0 580 90586 5
ICS 35.040

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 January 2016.

Amendments/corrigenda issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: PD ISO/IEC TR 20004:2015

TECHNICAL REPORT

ISO/IEC TR 20004

Second edition
2015-12-15

Information technology — Security techniques — Refining software vulnerability analysis under ISO/IEC 15408 and ISO/IEC 18045

Technologies de l'information — Techniques de sécurité — Redéfinition de l'analyse de vulnérabilité de logiciel selon l'ISO/CEI 15408 et l'ISO/CEI 18045

Reference number
ISO/IEC TR 20004:2015(E)

Documents
Document Sharing Hub

© ISO/IEC 2015

Full document details: PD ISO/IEC TR 20004:2015

COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

© ISO/IEC 2015 – All rights reserved

Documents
Document Sharing Hub

Full document details: PD ISO/IEC TR 20004:2015

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Terms and definitions **1**
3 Abbreviated terms **3**
4 Background context **4**
5 Vulnerability assessment activities **8**
5.1 Determine relevant potential vulnerabilities 9
5.1.1 Identify relevant weaknesses and attack patterns from existing structured assurance case 11
5.1.2 Identify relevant weaknesses and attack patterns from public sources 11
5.2 Assess TOE susceptibility to attack 14
5.2.1 Design and specify security/penetration testing 14
5.2.2 Execute and document security/penetration testing 15
5.3 Report on exploitable vulnerabilities 15
Bibliography **17**

© ISO/IEC 2015 – All rights reserved

Documents
Document Sharing Hub
Full document details: PD ISO/IEC TR 20004:2015

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 27, *IT Security techniques*.

This second edition cancels and replaces the first edition (ISO/IEC/TR 20004:2012), which has been technically revised.

© ISO/IEC 2015 – All rights reserved
Documents
Document Sharing Hub
Full document details: PD ISO/IEC TR 20004:2015

Introduction

This Technical Report is intended to provide added refinement, detail and guidance to the vulnerability analysis activities outlined in ISO/IEC 18045:2008 for the software elements of a TOE. Specifically, it is intended to add refinement and clarification of the "Potential vulnerability identification from public sources" (AVA_VAN.1.2E/2.2E/3.2E/4.2E) and "Penetration testing" (AVA_VAN.1.3E/2.4E/3.4E/4.4E) evaluator actions, which are currently imprecise in regards to searching for, identifying and testing relevant potential vulnerabilities. This Technical Report provides guidance on an approach to objectively search for, identify, filter and test potential vulnerabilities utilizing international ad hoc standard resources for software weaknesses and attack patterns. The set of relevant software weaknesses and attack patterns identified through this guidance represent a minimal set for analysis under the AVA_VAN assurance family in an ISO/IEC 15408 evaluation. Additional weaknesses and attack patterns may be determined relevant by specific national schemes, technical communities, associated protection profiles or other sources. In utilizing these standard structured resources, the approach defined here has the added benefit of being equally applicable to the TOE development process as it does to the TOE security evaluation process. This means that relevant weaknesses and attack patterns identified and tested for during development, whether defined ad hoc or as part of a structured assurance case, can provide a head start template for a TOE-specific set of relevant weaknesses and attack patterns for use in the security evaluation.

This Technical Report is intended to be used in conjunction with and, as an addendum to, ISO/IEC 18045.

This Technical Report does not address all possible vulnerability analysis methods, in particular those that fall outside the scope of the activities outlined in ISO/IEC 18045. It uses the common weakness enumeration (CWE) and the common attack pattern enumeration and classification (CAPEC) to identify possible attacks. It does not preclude the use of other appropriate identification resources by evaluators.

The target audience for this Technical Report is evaluators applying ISO/IEC 15408 and certifiers confirming evaluator actions, developers, PP/ST authors (to include Technical Communities), evaluator sponsors and other parties interested in IT security.

This Technical Report recognizes that not all questions concerning IT security evaluation will be answered herein and that further interpretations will be needed. Individual schemes will determine how to handle such interpretations and other guidance, although these can be subject to mutual recognition agreements.

© ISO/IEC 2015 – All rights reserved

Documents
Document Sharing Hub
Full document details: PD ISO/IEC TR 20004:2015

TECHNICAL REPORT ISO/IEC TR 20004:2015(E)

Information technology — Security techniques — Refining software vulnerability analysis under ISO/IEC 15408 and ISO/IEC 18045

1 Scope

This Technical Report refines the AVA_VAN assurance family activities defined in ISO/IEC 18045 and provides more specific guidance on the identification, selection and assessment of relevant potential vulnerabilities in order to conduct an ISO/IEC 15408 evaluation of a software target of evaluation. This Technical Report leverages publicly available information security resources to support the method of scoping and implementing ISO/IEC 18045 vulnerability analysis activities. The Technical Report currently uses the common weakness enumeration (CWE) and the common attack pattern enumeration and classification (CAPEC), but does not preclude the use of any other appropriate resources. Furthermore, this Technical Report is not meant to address all possible vulnerability analysis methods, including those that fall outside the scope of the activities outlined in ISO/IEC 18045.

This Technical Report does not define evaluator actions for certain high assurance ISO/IEC 15408 components, where there is as yet no generally agreed guidance.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
assurance case
structured set of claims, arguments and a corresponding body of evidence to demonstrate that a system satisfies specific claims with respect to its security properties

2.2
attack pattern
abstracted approach utilized to attack software

2.3
attack potential
measure of the effort to be expended in attacking a TOE, expressed in terms of an attacker's expertise, resources and motivation

[SOURCE: ISO/IEC 15408-1:2009, 3.1.5]

2.4
confirm
declare that something has been reviewed in detail with an independent determination of sufficiency

Note 1 to entry: The level of rigour required depends on the nature of the subject matter. This term is only applied to evaluator actions.

[SOURCE: ISO/IEC 15408-1:2009, 3.1.14]

2.5
CVE vulnerability
vulnerability listed in CVE

© ISO/IEC 2015 – All rights reserved

Documents
Document Sharing Hub
Full document details: PD ISO/IEC TR 20004:2015