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Information technology — Open Trusted Technology Provider™ Standard (O-TTPS) — Mitigating maliciously tainted and counterfeit products —

Part 1: Requirements and recommendations

Technologies de l'information — Norme de fournisseur de technologie de confiance ouverte (O-TTPS) — Atténuation des produits contrefaits et malicieusement contaminés —

Partie 1: Exigences et recommandations

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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).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by The Open Group and was adopted, under the PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

This first edition of ISO/IEC 20243-1 cancels and replaces ISO/IEC 20243:2015 of which it constitutes a minor revision to change the reference number from 20243 to 20243-1.

A list of all parts in the ISO 20243 series can be found on the ISO website.

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Preface

The Open Group

The Open Group is a global consortium that enables the achievement of business objectives through IT standards. With more than 400 member organizations, The Open Group has a diverse membership that spans all sectors of the IT community – customers, systems and solutions suppliers, tool vendors, integrators, and consultants, as well as academics and researchers – to:

- Capture, understand, and address current and emerging requirements, and establish policies and share best practices
- Facilitate interoperability, develop consensus, and evolve and integrate specifications and open source technologies
- Offer a comprehensive set of services to enhance the operational efficiency of consortia

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The Open Group publishes a wide range of technical documentation, most of which is focused on development of Open Group Standards and Guides, but which also includes white papers, technical studies, certification and testing documentation, and business titles. Full details and a catalog are available at www.opengroup.org/bookstore.

Readers should note that updates – in the form of Corrigenda – may apply to any publication. This information is published at www.opengroup.org/corrigenda.

This Document

The Open Group Trusted Technology Forum (OTTF or Forum) is a global initiative that invites industry, government, and other interested participants to work together to evolve this Standard and other OTTF deliverables.

This Standard is the Open Trusted Technology Provider Standard (O-TTPS). The Standard has been developed by the OTTF and approved by The Open Group, through The Open Group Company Review process. There are two distinct elements that should be understood with respect to this Standard: The O-TTPF (Framework) and the O-TTPS (Standard).

The O-TTPF (Framework): The Framework is an evolving compendium of organizational guidelines and best practices relating to the integrity of Commercial Off-the-Shelf (COTS) Information and Communication Technology (ICT) products and the security of the supply chain throughout the entire product life cycle. An early version of the Framework was published as a White Paper in February 2011 (see Referenced Documents). The Framework serves as the basis for this Standard, future updates, and additional standards. The content of the Framework is the result of industry collaboration and research as to those commonly used commercially reasonable practices that increase product integrity and supply chain security. The members of the OTTF will continue to collaborate with industry and governments and update the Framework as the threat landscape changes and industry practices evolve.

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The O-TTPS (Standard): The O-TTPS is an open standard containing a set of guidelines that when properly adhered to have been shown to enhance the security of the global supply chain and the integrity of COTS ICT products. This part 1 of the Standard provides a set of guidelines, requirements, and recommendations that help assure against maliciously tainted and counterfeit products throughout the COTS ICT product life cycle encompassing the following phases: design, sourcing, build, fulfillment, distribution, sustainment, and disposal.

Part 2 of the O-TTPS Standard, Assessment Procedures for the O-TTPS and ISO/IEC 20243,, provides assessment procedures that may be used to demonstrate conformance with the requirements provided in Section 4 of this part of the Standard.

Using the guidelines documented in the Framework as a basis, the OTTF is taking a phased approach and staging O-TTPS releases over time. This staging will consist of standards that focus on mitigating specific COTS ICT risks from emerging threats. As threats change or market needs evolve, the OTTF intends to update the O-TTPS (Standard) by releasing addenda to address specific threats or market needs.

The Standard is aimed at enhancing the integrity of COTS ICT products and helping customers to manage sourcing risk. The authors of this Standard recognize the value that it can bring to governments and commercial customers worldwide, particularly those who adopt procurement and sourcing strategies that reward those vendors who follow the O-TTPS best practice requirements and recommendations.

Note: Any reference to “providers” is intended to refer to COTS ICT providers. The use of the word “component” is intended to refer to either hardware or software components.

Intended Audience

This Standard is intended for organizations interested in helping the industry evolve to meet the threats in the delivery of trustworthy COTS ICT products. It is intended to provide enough context and information on business drivers to enable its audience to understand the value in adopting the guidelines, requirements, and recommendations specified within. It also allows providers, suppliers, and integrators to begin planning how to implement the Standard in their organizations. Additionally, acquirers and customers can begin recommending the adoption of the Standard to their providers and integrators.

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Referenced Documents

The following documents are referenced in this Standard:

- 2007 Defense Science Board Task Force on Mission Impact of Foreign Influence on DoD Software, September 2007; findings and recommendations located at: www.acq.osd.mil/dsb/reports/ADA486949.pdf.
- Electronic Industry Citizenship Coalition (EICC) Code of Conduct; refer to: www.eicc.info.
- ISO/IEC 15408: Information Technology – Security Techniques – Evaluation Criteria for IT Security (Common Criteria).
- ISO/IEC 27000:2009: Information Technology – Security Techniques – Information Security Management Systems – Overview and Vocabulary.
- ISO/IEC Directives, Part 2: Rules for the Structure and Drafting of International Standards.
- NIST 800-12: An Introduction to Computer Security: The NIST Handbook.
- White Paper: Open Trusted Technology Provider Framework (O-TTPF), W113, published by The Open Group, February 2011; refer to: www.opengroup.org/bookstore/catalog/w113.htm.

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1 Introduction

This chapter introduces this part of the Standard – the Open Trusted Technology Provider Standard (O-TTPS) – and the normative terminology that should be understood in relation to specific requirements and recommendations found in Chapter 4 of this document.

1.1 Objectives

This part of the Open Trusted Technology Provider Standard (O-TTPS) is a set of guidelines, requirements, and recommendations that, when practically applied, create a business benefit in terms of reduced risk of acquiring maliciously tainted or counterfeit products for the technology acquirer. Documenting best practices that have been taken from the experience of mature industry providers, rigorously reviewed through a consensus process, and established as requirements and recommendations in this Standard, can provide significant advantage in establishing a basis to reduce risk. A commitment by technology providers, large and small, suppliers of hardware and software components, and integrators to adopt this Standard is a commitment to using specific methodologies to assure the integrity of their hardware or software Commercial Off-the-Shelf (COTS) Information and Communication Technology (ICT) products. This Standard is detailed and prescriptive enough to be useful in raising the bar for all providers and lends itself to a certification process to provide assurance that it is being followed in a meaningful and repeatable manner.

1.2 Overview

This part of the Standard (O-TTPS) is a set of guidelines, requirements, and recommendations that address specific threats to the integrity of hardware and software COTS ICT products throughout the product life cycle. This release of the Standard addresses threats related to maliciously tainted and counterfeit products.

The provider's product life cycle includes the work it does designing and developing products, as well as the supply chain aspects of that life cycle, collectively extending through the following phases: design, sourcing, build, fulfillment, distribution, sustainment, and disposal. While this Standard cannot fully address threats that originate wholly outside any span of control of the provider – for example, a counterfeiter producing a fake printed circuit board assembly that has no original linkage to the Original Equipment Manufacturer (OEM) – the practices detailed in the Standard will provide some level of mitigation. An example of such a practice would be the use of security labeling techniques in legitimate products.

The two major threats that acquirers face today in their COTS ICT procurements, as addressed in this Standard, are defined as:

1. Maliciously tainted product – the product is produced by the provider and is acquired through a provider's authorized channel, but has been tampered with maliciously.

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2. Counterfeit product – the product is produced other than by, or for, the provider, or is supplied to the provider by other than a provider's authorized channel and is presented as being legitimate even though it is not.

Note: All instances, within this standard, of the use of the words: taint, tainted, tainting, refer to maliciously taint, maliciously tainted, and maliciously tainting, respectively.

Trusted Technology Providers manage their product life cycle, including their extended supply chains, through the application of defined, monitored, and validated best practices. The product's integrity is strengthened when providers and suppliers follow the requirements and recommendations specified in this Standard. The industry consensus reflected here and in the Open Trusted Technology Provider Framework (O-TTPF) draws from the following areas that are integral to product integrity: product development/engineering, secure development/engineering, and supply chain security. Additionally, product integrity and supply chain security are enhanced by following practices among suppliers, trading partners, providers, and, when appropriate, acquiring customers to preserve the product's intended configuration.

This Standard is focused on the security of the supply chain *versus* the business management aspects of the supply chain. This Standard takes a comprehensive view about what providers should do in order to be considered a Trusted Technology Provider that "builds with integrity". This includes practices that providers incorporate in their own internal product life cycle processes, that portion of product development that is "in-house" and over which they have more direct operational control. Additionally, it includes the provider's supply chain security practices that need to be followed when incorporating third-party hardware or software components, or when depending on external manufacturing and delivery or supportive services.

The Standard makes a distinction between provider and supplier. Suppliers are those upstream vendors who supply components or solutions (software or hardware) to providers or integrators. Providers are those vendors who supply COTS ICT products directly to the downstream integrator or acquirer.

Ideally, the guidelines, requirements, and recommendations included in this Standard will be widely adopted by providers and their suppliers regardless of size and will provide benefits throughout the industry.

For this version of the Standard, the following elements are considered out of scope:

- This Standard does not focus on guidelines, requirements, and recommendations for the acquirer. The Forum is considering addressing this area in subsequent versions of the Standard. In the meantime, an acquirer does have a role to play in assuring that the products and components they procure are built with integrity. One of the ways that the acquirer can do that is to require their providers, suppliers, and integrators to be Trusted Technology Providers. Another way is to not knowingly support the "grey market", realizing that if an acquirer elects to receive hardware or software support from grey market suppliers, it is at their own risk and generally outside of the influence of the legitimate provider.
- This Standard is not meant to be comprehensive as to all practices that a provider should follow when building software or hardware. For a more comprehensive set of foundational

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