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Information technology — TLS specification for storage systems

Technologies de l'information — Spécification TLS pour systèmes de stockage

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Foreword

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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 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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This document was prepared by SNIA (as TLS Specification for Storage Systems, Version 2.1) and drafted in accordance with its editorial rules. It was adopted, under the JTC 1 PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

This second edition cancels and replaces the first edition (ISO/IEC 20648:2016), which has been technically revised.

The main changes are as follows:

— a statement has been added regarding the relevance of ISO/IEC 20648 to Datagram Transport Layer Security (DTLS) implementations;

— a statement has been added regarding quantum computing and TLS;

— a statement has been added encouraging the use of TLS 1.3;

— a recommendation has been added to guard against replay attacks on zero round-trip time (0-RTT) for TLS version 1.3;

— the recommended cipher suites have been aligned with the RFC 7525 recommendations on forward secrecy;

— the requirements concerning 112 bits of security strength have been changed to 128 bits of security strength;

— the requirements for the maximum certificate validity period have been changed from 3 years to 398 days;

— the requirements associated with the ECDSA signature certificate have been clarified;

— a requirement has been added for including the TLS 1.3 extension for pre-shared key (PSK) support.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

Introduction

Within information and communications technology, one of the best defences against telecommunications attacks is to deploy security services implemented with mechanisms specified in standards that are thoroughly vetted in the public domain and rigorously tested by third party laboratories, by vendors, and by users of commercial off-the-shelf products. Three services that most often address network user security requirements are confidentiality, message integrity and authentication.

The Internet Engineering Task Force (IETF) with its Transport Layer Security (TLS) has a standard that supports preventing tampering, message forgery, and eavesdropping by encrypting data units, or segments, from one end of the transport layer to the other. In addition, TLS is application protocol independent, which means higher-level protocols like the Hypertext Transfer Protocol (HTTP) can layer on top of the TLS protocol transparently.

Additional details beyond the basic TLS protocol specification are necessary to ensure both security and interoperability. This document provides detail in the form of specific requirements and guidance for using TLS in conjunction with storage systems.

Information technology —TLS specification for storage systems

1 Scope

This document details the requirements for use of the Transport Layer Security (TLS) protocol in conjunction with data storage technologies. The requirements set out in this document are intended to facilitate secure interoperability of storage clients and servers as well as non-storage technologies that may have similar interoperability needs.

This document is relevant to anyone involved in owning, operating or using data storage devices. This includes senior managers, acquirers of storage products and service, and other non-technical managers or users, in addition to managers and administrators who have specific responsibilities for information security and/or storage security, storage operation, or who are responsible for an organization's overall security program and security policy development. It is also relevant to anyone involved in the planning, design and implementation of the architectural aspects of storage security.

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.

ISO/IEC 27000, *Information technology — Security techniques — Information security management systems — Overview and vocabulary*

IETF RFC 5280, *Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile*, IETF, May 2008

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

IETF RFC 5746, *Transport Layer Security (TLS) Renegotiation Indication Extension*, IETF, February 2010

IETF RFC 8446, *The Transport Layer Security (TLS) Protocol Version 1.3*, IETF, August 2018